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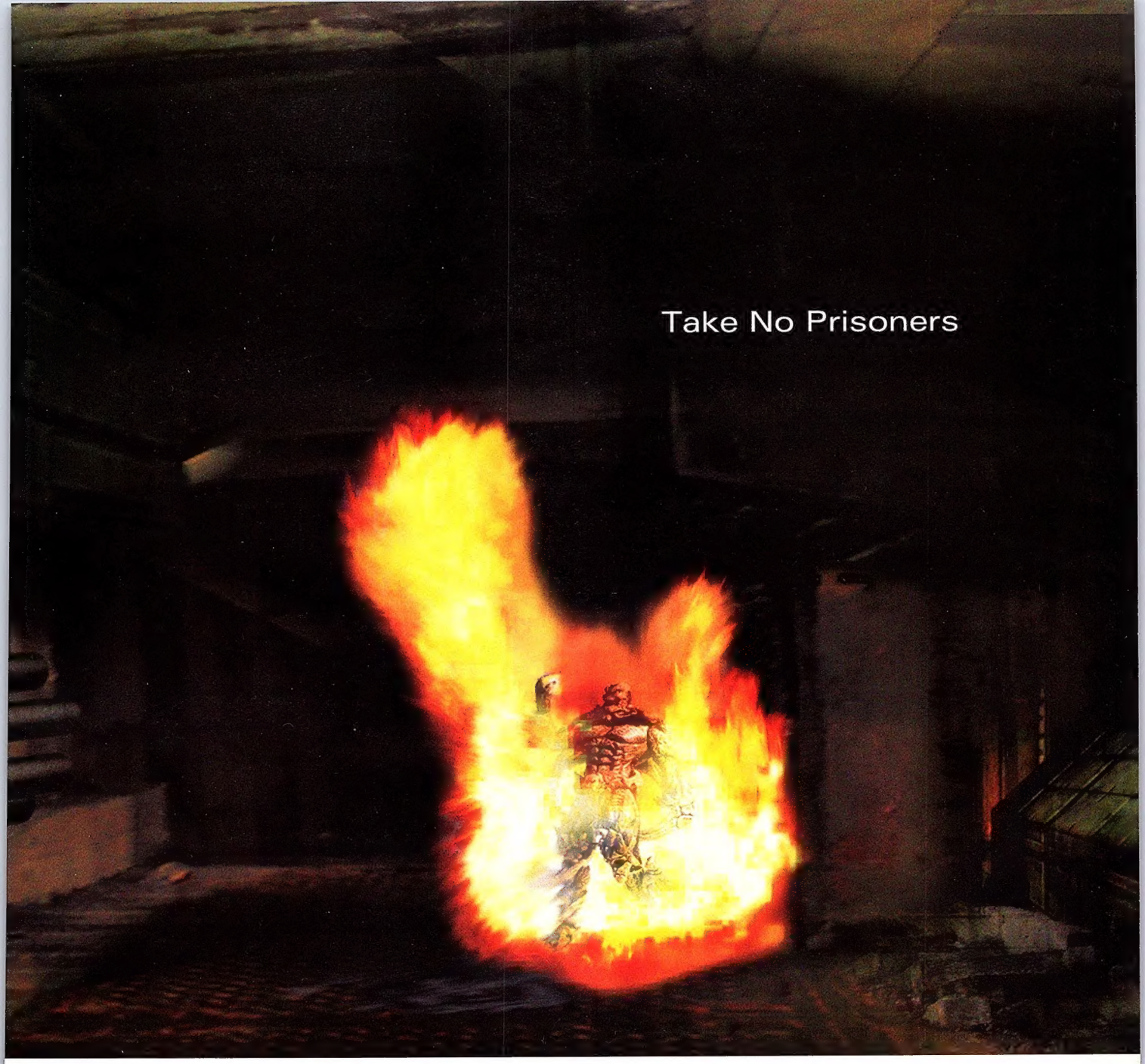

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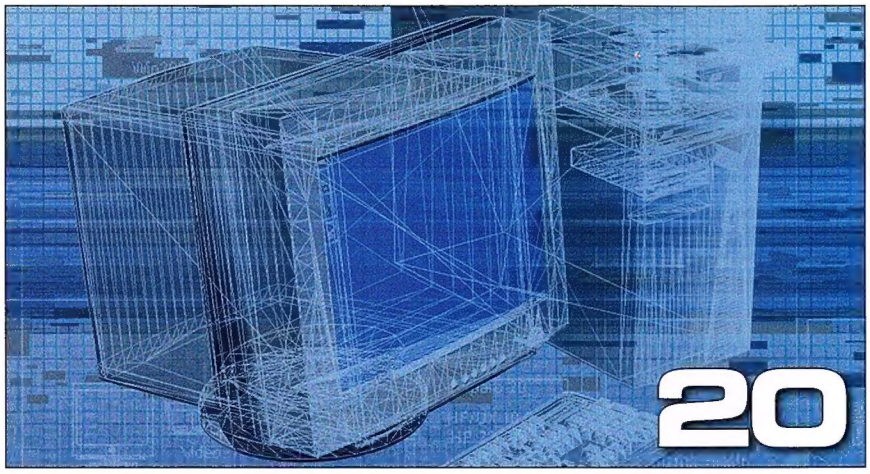

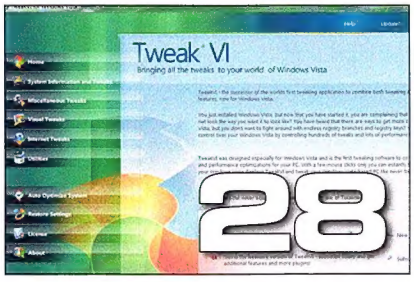

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EDHEAD

Yearly snooze

Despite my optimism, 2007 is going to be a very boring year for gaming and hardware. Other than the imminent release of STALKER, and Crysis and BioShock in a few months time, there's nothing really to look forward to in the realm of PC. I've been trying to get extra-worked-up about these, but I'm already at maximum excitement. Any more and my eyebrows are going to escape off the top of my head, flying into orbit, get confused for a Russian satellite and get taken down by the US.

AMD's R600 has been delayed again, and it doesn't look like we'll see AMD's next-gen CPU architecture until 2008. Intel will continue to beaver away at 45nm and smaller, but it'll still be dual or quad core, and we currently have no reservations about it totally owning AMD's now-ancient K8. And 'Fusion'? Again, 2008 or later.

Perhaps it's time we stopped letting the big companies dictate what we should and shouldn't be excited about. For instance, when everyone had given up on Egosoft's X3, I was brave enough to pick it up. True, I met a few hurdles, but for a few weeks I was able to get everyone in the office semi-riled up about playing it again. Not an easy task, but it did happen.

With this outlook on the world in mind, I've decided to get completely enamoured by sound cards. Random as hell you say? Not exactly.

Yes, Creative has been, up until now, the only option for the gamer and non-gamer, unless you could stand onboard – which isn't so bad, really. Now, we have cards sporting C-Media chips and boy, they're pretty darn nice. In fact, I'm running an Auzentech X-Meridian and my Audigy 2 lies unused in its original box. The quality is better, the crackling and pops are gone, the Vista drivers aren't time-bombed betas and I honestly couldn't be happier. It's not the best for gaming, eating one too many a CPU cycle and not handling anything better than EAX 2.0, but then, EAX is dead in Vista on everything but the X-Fi... so it's not like I was using it anyway.

So, if you're looking to be excited about something, keep an eye on the sound card market. I'm predicting it'll come back in a big way... as long as Creative doesn't buy everyone.

Now for this issue. I reckon it's grand. Super-grand even. Craig worked extremely hard to bring two immense features to you. The first is a building guide for those after a cheap but powerful gaming rig and the second a roundup of sub-$800 LCDs. An awesome combo from Craig the Almighty, and we're very happy with what he's done. Craig's happy too, but he's a bit too insane right now to notice.

Ashton also put together a Vista tweak guide, written to an Atomican's exacting standards. Even if you think you have Vista worked out, you'll definitely find something here.

At the tail end of the mag there's Ron Prouse's PC-in-a-suitcase mod, which you can follow along with and Leigh Dyer has your Linux on Mac needs sorted.

Logan Booker
lbooker@atomicmpc.com.au

Atomic 73 winners: 10x Maelstrom for PC – D. Molloy, Melrose Park SA; C. Mullins, Willunga SA; C. Waun, Bunbury WA; R. Garreffa, Seaford Rise SA; B. Banks, Yeronga QLD; D. Katselas, Panania NSW; J. Cross, Greenwith SA; M. Bottroff, Elizabeth Park SA; A. Hirsch, Epping NSW; L. Coluccio, Sydney NSW

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TECH TRENDS

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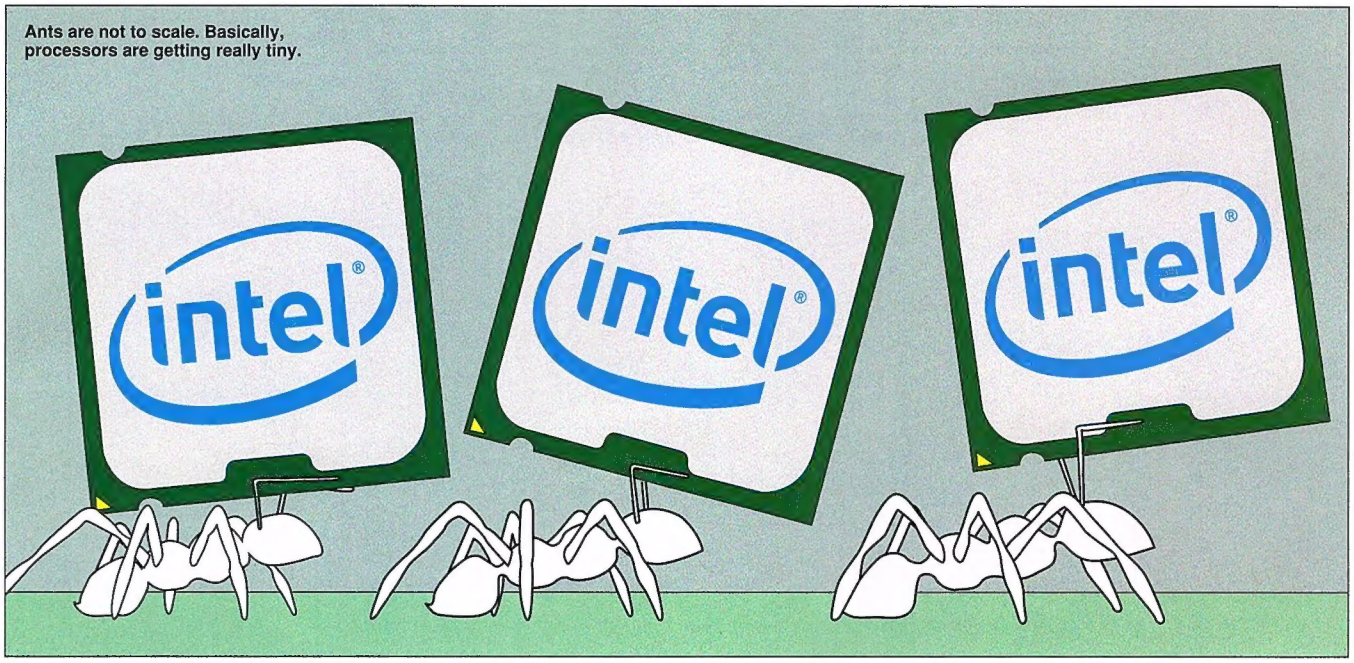


Ants are not to scale. Basically, processors are getting really tiny.

Intel goes 45nm

Craig Simms notices his bits are getting smaller.

So we're now at 45nm. Code named *Penryn*, Intel's new part should be headed for the second half of this year, but conflicting rumours say it may come out in the first half of this year, or 2008. We'll stick with Intel's official announcement for now. The first parts we should see are *Yorkfield*, a quad core, 1333MHz part; and Wolfdale, the equivalent dual core part. Expect speeds up to about 4GHz.

Bloomfield, *Yorkfield*'s successor set for Q3 2008, is expected to bring updated HyperThreading back to the public, allowing up to eight simultaneous threads to be executed.

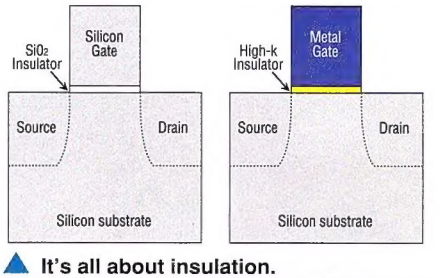
The D1D fab in Oregon and Fab 32 in Arizona are geared up for production, with Fab 28 in Israel set to take up the process in 2008.

With the exception of Intel's speedy Extreme Edition parts, the company will be looking to match the same 65W thermal envelope as today's processors. A further speed boost should arrive in the form of SSE4, for those applications that support it.

All this is possible thanks to a new transistor design, where the silicon oxide gate dielectric is replaced by a hafnium-based high-k oxide – addressing leakage while still maintaining high capacitance. An undefined metal has also replaced the usual poly-silicon gate electrode, to ward off defects at the gate dielectric/gate electrode boundary that makes it difficult to lower the threshold voltage, otherwise known as Fermi-level pinning. The threshold voltage is the level between high and low that distinguishes whether a transistor is on or off. This new approach will also keep phonon scattering at bay, an effect that limits electron mobility.

All these chips are expected to have 6MB L2 cache shared for each two cores, which equals a monolithic 12MB available for the quad core.

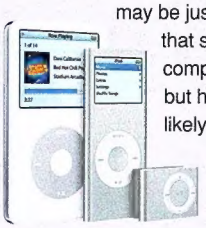
AMD's 45nm part is nowhere to be seen, however IBM has announced a 45nm process and is working with AMD. Some claim AMD's Shanghai part due in 2008 will be 45nm, but AMD's own roadmaps identify Shanghai as 65nm.



▲ It's all about insulation.

SHORT CIRCUITS

Steve Jobs has called for an end to Digital Rights Management (DRM). Steve may be just big enough that some record companies might listen, but his intent is more likely to get European governments to target record companies (two of the big four companies, Vivendi and EMI are in Europe) for 'forcing' him to use DRM.

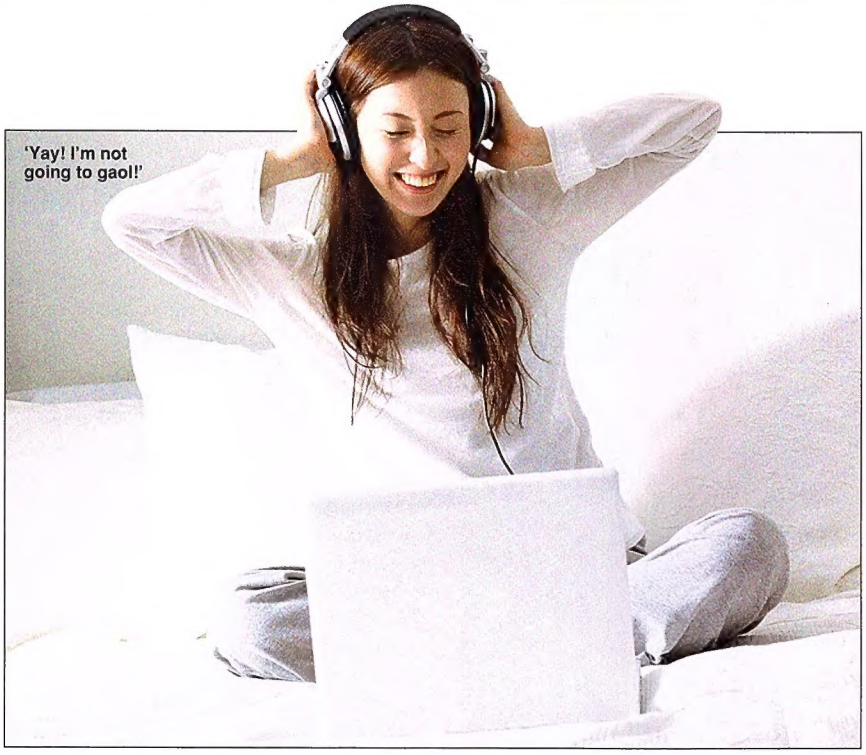


Kodak has entered the all-in-one printer/ scanner/fax market, claiming to be able to sell ink at half the price of HP. No word yet on the quality of the print though.

Google's once invite-only web mail service, Gmail, is now open to the public. We've been using it for so long, we hadn't noticed.

Samsung has announced LCD tech that uses an LED backlight, and is capable of a 100,000:1 contrast ratio – something previously only promised by SED. LCD might be better than SED before Canon manages to get the beleaguered technology out the door. Sadly the demo model was only 720p, hopefully the 1080p models aren't far behind.

Transmeta has cut 39 percent of its workforce, choosing to focus on IP licensing and development rather than engineering.



'Yay! I'm not going to gaol!'

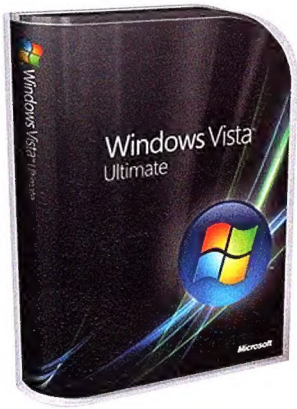
RIAAlly annoyed

The RIAA has been forced to cough up $63,000 to pay for 'reasonable attorney fees', after the case against Deborah Foster was dismissed last year.

The RIAA attempted to try Foster for downloading music, and when an out-of-court settlement could not be reached, the RIAA tried to back out seeking a dismissal. Sadly for the RIAA, Foster had already made a counter-claim of 'a declaratory judgment of non-infringement' and refused to dismiss it.

As the RIAA already sought to dismiss its claim and there was no longer any point of pursuing, the courts dismissed Foster's claim but judged her to be the prevailing party, awarding legal costs. Are the courts finally getting sick of the RIAA's 'standover' tactics as well.

Aerotic acrobatics



Two Vista exploits are already out of the traps – one that allows Upgrade edition users to do full installs and one that extends the non-activation period from 30 to 120 days.

The former is apparently achieved by installing Vista without a product key, selecting the edition that you have, then running an in-place upgrade installation from within the installed Vista with the legit product key.

The second isn't much trickier – open up a command prompt and type 'slmgr –rearm' – which resets the trial period back to 30 days. This can be done three times for a maximum of 120 days.

The Xbox 360 is set to get a new BenQ DVD drive – which is reported to be quieter and faster. Rumours have it the 65nm CPU refresh has been delayed until mid-year, which should lead to less heat generation and thus can allow quieter fans. Either way, the 360's faults are slowly being addressed.

AMD's R600 (now officially known as the X2800XTX) has again been delayed, slipping into the second quarter of this year. Best estimates place the new launch date in April, which means there's not *that* much longer to wait, really. What it does do is put the company even further behind NVIDIA in the technology stakes and leaves the AMD range barren of DirectX 10-capable parts. Apparently, the story is they want to release an entire family of products at once, but we wouldn't be surprised if they're trying to reduce the part's freakish size.

FUTUREPROOF

Gazing into the crystal ball of tech

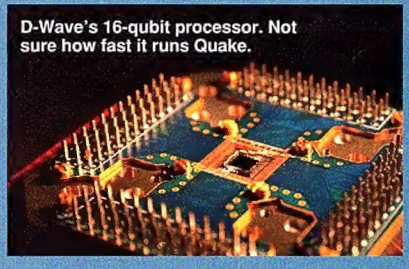
Quantum's back

Now, now, don't get too excited. We wouldn't want you to go chucking your PC on the garbage heap and standing in line for a quantum computer just yet. Quantum is back, yes, but only in the sense that it no longer resides in the confines of a laboratory.

D-Wave, a company based in Vancouver in Canada, showed off what it describes as a 16-qubit processor. The processor was able to not only solve a couple of equations, but also play a game of Sudoku.

The company has tackled the quantum mechanics problem by exploiting the superconductor properties of a metal called niobium. One of the inherent problems of quantum mechanics is the difficulty in controlling and accessing the state of a qubit without corrupting its state. Using ultra-chilled circuits made of niobium, D-Wave has been able to amplify the current 'state' of the qubits in each circuit, increasing the resilience of the stored information through raw redundancy.

It's a rather clunky solution and needs further refinement, but D-Wave seems confident that it will be able to create 1000-qubit processors in the next couple of years, according to the company's CIO Geordie Rose.



D-Wave's 16-qubit processor. Not sure how fast it runs Quake.

POST OF THE MONTH

All behold: elvenwhore's The *Atomic* Tarot

http://www.atomicmpc.com.au/forums.asp?s=1&c=1&t=101978 & **http://atomictarot.freehostia.com/main.html**

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Thank you elvenwhore, you are indeed deeply in tune with *Atomic* and its amazing inhabitants. Your Tarot is a lovely gift from a very special person.

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SCANNER ... dustry and ... online news for the ... enthusiast

Diabloed to death

Logan Booker does his best not to catch the hack'n'slash fever.

Role-playing hack'n'slash gaming is back in a big way, judging by the recent increase in games of this type under development. Perhaps spurred by the success of Iron Lore's Diablo II clone Titan Quest, Monte Cristo's Silverfall, SkyFallen's Dawn of Magic, Ascaron's Sacred 2 and finally, the TQ expansion Immortal Throne, have come out of the woodwork in the last eight months.

'[Titan Quest] marked a strong global success for THQ on both a critical and commercial level,' said the company's senior VP of worldwide marketing Bob Aniello in a November 2006 press release announcing the development of Immortal Throne. Apparently, gamers have yet to tire of the pokie-machine gameplay of the genre.

Monte Cristo has made little effort to hide the influences on its title, Silverfall, with the game's project manager Jehanne Rousseau stating in the company's IGN-hosted developer blog that 'Strictly in terms, Silverfall is akin to games like Diablo or Sacred'. Silverfall, unlike Titan Quest, will mix the formula up a little by providing two schools for players to pick their abilities from – Science and Nature (this may borrow from Troika's Arcanum, which is fine by us). For example, if a player wanted to be melee-based, they could choose to be a werewolf, or gain robotic implants that increase physical strength. Both choices achieve a similar effect, but allow the player to flavour their character. Monte Cristo also mentions on the game's site the player's choices will alter the state of the world, changing the types of items vendors sell and the appearance of the environment.

Sacred 2 is Ascaron's hack'n'slash effort, which we've mostly covered in Pipeline this month (check out the page opposite). Six characters should be playable at launch but currently only information on one has been released. We'd like to say more about the game but sadly the only 'feature' we know of is 'Gore Feedback', which displays visually as you combat foes how powerful you are. Lovely.

Dawn of Magic, or Blood Magic as its known overseas, takes yet another approach. Instead of supplying the player with multiple classes, there's just one – the magician. Customisation comes through spell selection, of which there are a dozen schools to peruse. Gameplay consists of casting spells by themselves, or combining one or more spells along with a weapon to produce unique effects. DoM will be tailored for online play and will feature duelling and arena components so players can test their skills against one another. Finally, five difficultly levels should have you coming back for more after you finished the game.

Of course, for the Titan Quest enthusiast, there's Immortal Throne which, beside Sacred 2, is the most disappointing of the lineup. The strongest criticism of TQ came from its lack of originality with the hack'n'slash formula, and this trend is set to continue with the expansion. To Iron Lore's credit, it is introducing another set of skills to customise your character but otherwise it looks to be more of the same.

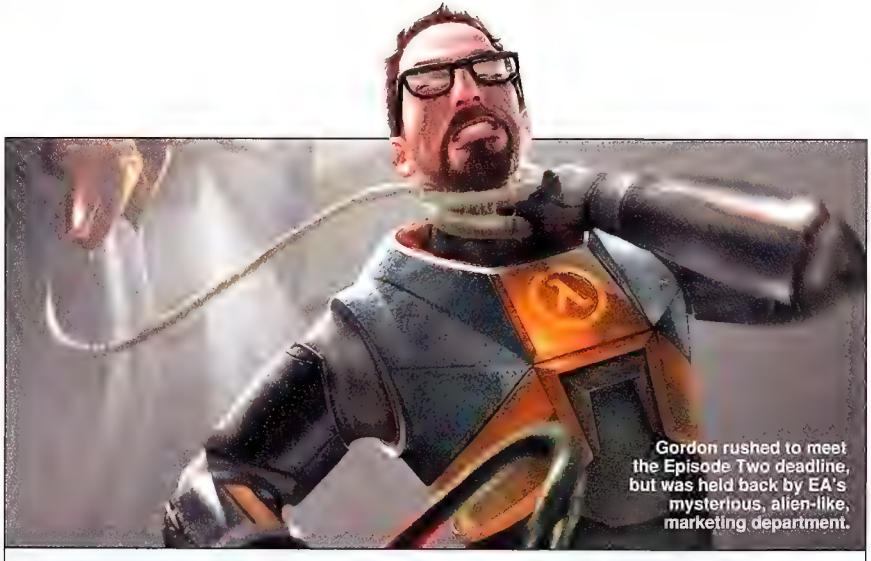
> "The strongest criticism of TQ came from its lack of originality with the hack'n'slash formula."

SHORT CIRCUITS

Atari's third quarter results, published early February, show the beleaguered publisher continues to fight financial difficulties, with net revenue during the period down 47.3 percent compared to the same period last financial year. Apart from Neverwinter Nights 2, Atari's gaming lineup is less than fantastic and the company will have to pull something particularly shiny from its nether regions if it wants to survive.

Your target market playing games more and more? Then why not make use of this fact to aid your advertising efforts? This is exactly what Coke-a-Cola has done with a recent commercial, parodying a GTA-style game with interesting results. Check out the somewhat humorous ad here: **www.youtube.com/watch?v=zfhZfSVuup4**

Introversion has just put the finishing touches on a 'Vista' version of its excellent strategy title Darwinia. Darwinia Vista features an all-new DirectX renderer (over the OpenGL one of the original); support for the Xbox 360 controller; advanced particle



Gordon rushed to meet the Episode Two deadline, but was held back by EA's mysterious, alien-like, marketing department.

To be continued, eventually

Logan Booker wonders if you can delay a delay.

Half-Life 2: Episode Two has been delayed in a move from Valve that, let's face it, was completely expected. A press release on 7 February from publisher EA and the developer announced not only the availability of two versions of the game – Black and Orange – but a pushed release as well.

As for the versions, 'Black' will contain HL2: E2, TeamFortress 2 and Portal, while 'Orange' will pack the aforementioned along with Half-Life 2 and Episode One. The new worldwide release date is 'Fall 2007', or autumn for us Australians.

Small compensation comes in the form of Steam, Valve's online distribution client, that will no doubt allow you to download your pack of choice as soon as Valve has finished Episode Two, TF 2 and Portal. And in the case of TF 2, what's another few months to wait for a game that's kept us waiting for eight years?

GO3 goes ahead

E3 maybe be gone, but games are still in high demand.

If you happen to live in Perth, near to Perth or planning a trip to Perth, then the GO3 Electronic Entertainment Expo may tickle your fancy.

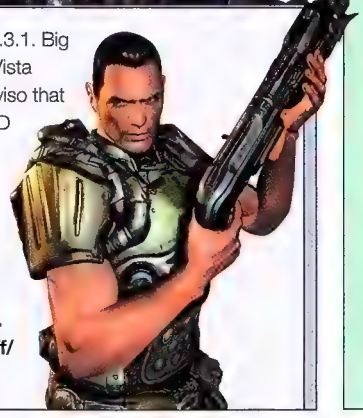
GO3 will be held on 30 March to 1 April at the Perth Convention Exhibition Centre. The event will play host to a massive BYO LAN party and the US$400,000 Electronics Sports World Cup (in conjunction with WALAN and DNA), as well as a Dance Dance Revolution, Cos-play and game developer competitions. Speakers will include the likes of Metal Gear creator Hideo Kojima and Gears of War producer Rod Fergusson.

If you're thinking of attending, prices start at $15 for students and $18 for adults. For more info, hit up **www.go3.com.au**.

and shader effects and three new levels. A bit of something for everyone really.

Dark Avatar, the expansion to Stardock's space-based 4X strategy game Galactic Civilizations II, is now available for download via the company's online distribution client, and on retail shelves from 24 February.

id has patched Doom 3, updating the popular shooter to 1.3.1. Big changes include better Vista compatibility, on the proviso that you have an NVIDIA/AMD OpenGL ICD and not Vista's crappy DirectX-wrapped alternative and fixes to the sound engine. You can grab the update here directly from id's FTP server: **ftp.idsoftware.com/idstuff/doom3/win32**.



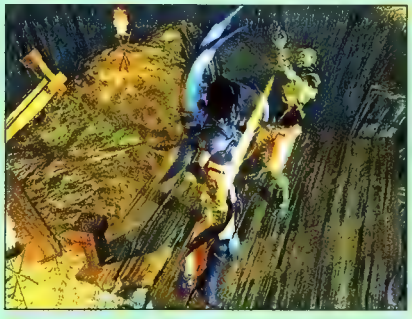
PIPELINE Hot games to watch out for

Aion: Tower of Eternity

Release date TBA 2007

Aion is proof that MMO mania still holds the industry at its mercy. It's the latest title from industry veteran NCSoft and with Garriott's Tabula Rasa edging closer to release it's not surprising that the company has decided to start on something new. NCSoft claims that the game will be the 'most visually stunning MMORPG … ever made' and will make use of the, uh, visually stunning Unreal Engine 3. Along with a faction-based 'PvPvE' system, angels and demons, and a story driven by player choices, Aion may be the fresh take on MMOs we've been looking for. More info as we get it.

Platform PC
Developer NCSoft
Publisher NCSoft
Web www.plaync.com/us/games/aion



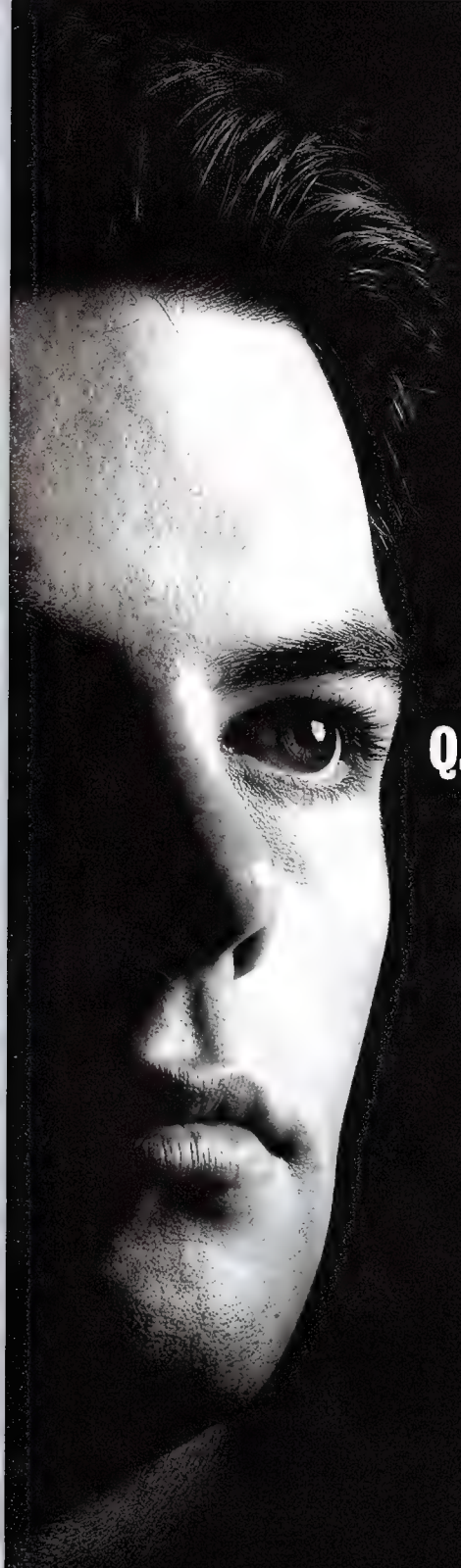
Sacred 2: Fallen Angel

Release date: TBA

A world of magic and technology? Sounds a bit like Arcanum! The difference here is that Sacred 2 is a Diablo II style hack'n'slash rather than a deep RPG.

We had a quick look at Ascaron's Sacred 2 at E3 2006 and, judging by the website, it doesn't look like much progress has been made. There's still just the one character, The Seraphim; the screenshots of the areas in the game are the same as those from last year and there's still not release date. Regardless, the original Sacred has a strong cult following and if you're a fan, you'll no doubt want to check this out.

Platform PC
Developer Ascaron
Publisher TBC
Web www.sacred2.com



If your answer was E, you should consider studying for your degree at the Australian Defence Force Academy (ADFA). ADFA is a campus of the University of New South Wales located in Canberra. Here you can get a degree in Engineering, Technology, Science, Business or Arts and you'll also learn the leadership skills you'll need as an officer in the Australian Defence Force. There are all kinds of officer positions available from Administration and Logistics through to Aviation, Intelligence and Engineering. You could become a Marine Engineer in the Navy, a Pilot in the Army, or even an Air Defence Officer in the Air Force – there are dozens of exciting

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C. GREAT SALARY
D. FREE TUITION
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The eyes of a man with creative drive. We also find him rather dashing.

Chris Avellone

Alexander Gambotto-Burke camps in a dungeon with Chris Avellone, Chief Creative Officer at Obsidian Entertainment and lead developer on Neverwinter Nights 2.

atomic Neverwinter Nights has had an unprecedented shelf-life thanks to its toolset, which allows even first-time users to create their own campaigns very quickly. What's the main improvement Obsidian has made for the NWN2 toolset?

Chris Avellone Well, for any features we included with Neverwinter Nights 2, we tried to make sure there were a bunch of parameters about each that the end user could absolutely modify. I'll give you an example – we redid water. Okay, so we've got a coder working on that. While he's doing that, though, he makes sure when he's implementing the water that all the water's variables can be tweaked by a designer. A designer can control its choppiness, what direction it's flowing, its viscosity, its colour – the cool thing is that once the programmers set it up like that, designers can pull off some very cool effects. So, for example, if you remove the choppiness from the water, slow it down to a crawl, make it pretty viscous, and then you put molten red texture over the top of it, you've got lava! Whatever we implement, it needs enough variables to do a wide range of things.

atomic Do you ever find technology gets in the way of game design? How do you feel when that happens?

Chris Avellone A little frustrated, but at the same time there's usually a good explanation as to why it can't happen, and that makes it a little easier to swallow. But I will say that it's part of a designer's skill-set to recognise when they're working in limitations. And some of the better designers I've worked with find ways to turn those limitations into advantages. Say, for example, they only have a certain number of animations – they'll actually design scenarios that maintain the theme of what's in their head, but actually accommodate the fact that you can't have unique animations for every story bit.

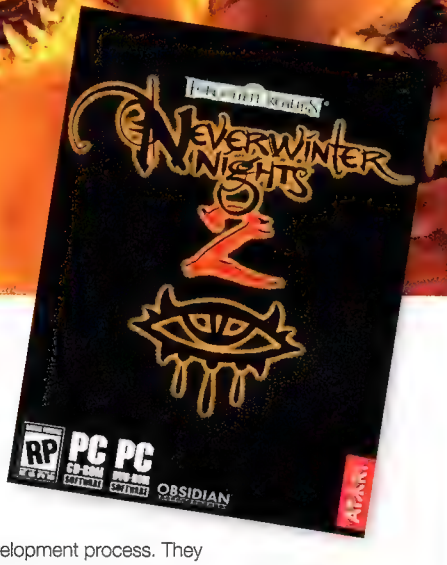
atomic Ever find yourself being too ambitious?

Chris Avellone Yeah, like with Knights of the Old Republic II. That was basically a time versus resources issue. There wasn't time to implement all that stuff, and to be honest, as lead designer, that was my call. Basically, we should have cut one planet from the game, and then taken all the energy that would be required to finish that one planet, and give the ending more attention. That was an oversight on my part, and I still feel bad about it. But the game did have a very aggressive release schedule.

Working with limitations is a key skill for NWN2's scenario designers.

NWN2 was designed from the ground up to be customisable. For example, you can give these guys pants.

Talking sternly to a denizen of the depths while standing on the precipice of oblivion... it just as important as combat in NWN 2.



atomic Would you say there's been any consistent theme throughout your work?

Chris Avellone I think it would be that we try to recognise that every character you write, and every mission you set up, has to accommodate a number of different play styles. It's not just whether the player's being good or evil; you have to accommodate how people complete certain objectives. Fallout paved the way for all that, because that game told us that there should absolutely be another way to succeed in a mission that doesn't involve talking or combat, which are the obvious ones. If you're playing diplomacy boy, you should be able to talk your way out of certain situations; combat guy should be able to shoot their way through. And something like stealth should be implemented as well. Players should always feel cool about the way they're playing the game.

atomic There also seems to be a focus on making companions and other major characters of a much greater depth than what's seen in most games.

Chris Avellone: Basically, my feeling is that players can only achieve a certain amount of depth in the world with their own character. If they have people in their environment with at least equal depth, though, the player can gain a lot of strength from that. Especially if they ask a lot of serious questions about the player that really make you think. I think that really adds to the experience. They may even be able to show the player something about his play style that they may not have even realised. I think that's an important part of the gameplay. Plus, I just enjoy writing complex characters. They make the world seem more real.

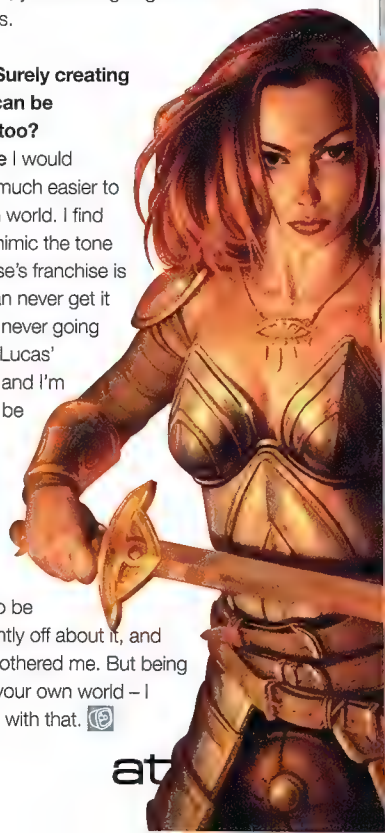
atomic Does creating these characters and stories become more difficult when you're working with licensed franchises – as you've done for almost every game you've worked on – because you have to work within strict boundaries?

Chris Avellone Generally, the limitations are the following: because everything is defined, you need to learn what those boundaries are. You have to learn everything you can about the franchise, which can be a lot of work. Second of all, you have to run everything by the franchise holder for approval. But that's actually been fine for us, because we get on really well with Wizards of the Coast. And with Star Wars, to be honest, I think we only had like ten comments during our whole development process. They were just little things, like, 'Oh, I think you've spelled this character's name wrong.' It was nothing. As long as you do your research and know the genre, you're not going to have too many problems.

> "I'm never going to get George Lucas' tone just right, and I'll never get Ed Greenwood's view of The Forgotten Realms just right."

atomic Surely creating your own IP can be problematic, too?

Chris Avellone I would actually find it much easier to create my own world. I find that trying to mimic the tone of someone else's franchise is difficult; you can never get it quite right. I'm never going to get George Lucas' tone just right, and I'm never going to be able to get Ed Greenwood's view of The Forgotten Realms just right. There's always going to be something slightly off about it, and that's always bothered me. But being able to create your own world – I feel much freer with that.



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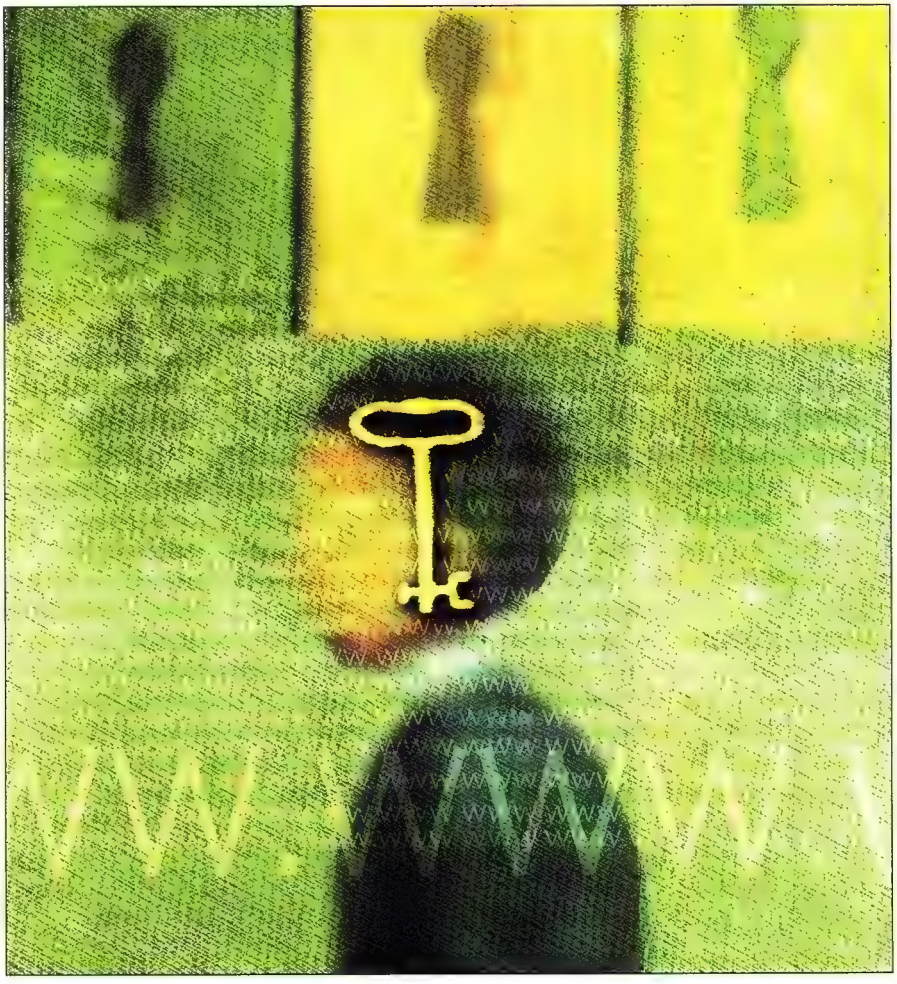
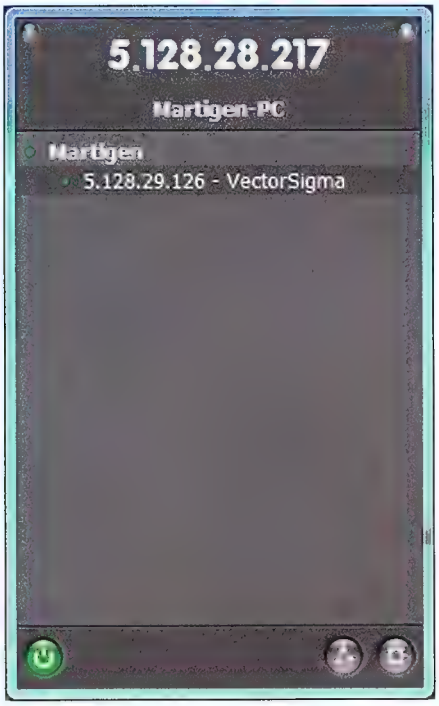




Ashton would like to think that he has heaps and heaps of mates, but his friends list here tells another story. A sad, lonely story.

Punching through firewalls

Ashton Mills straps on some flame-retardant clothing and attempts to venture through a few walls of fire.

A long time ago, mankind made a firewall. Its purpose was simple and clear – block incoming and, optionally, outgoing ports. It could be blanket, or allow traffic to or from specific ports, or even IP addresses. Later, it could even be done based on protocol.

In this humble beginning, it was elegant and simple, but the demands of users, and networks, were not. Especially in large networks, with the demands of different work environments, there would be a plethora of necessary Internet-enabled applications, and opening up the ports for all of them would give you a firewall that resembled Swiss cheese, rather than anything effective. And why open ports that may only be used once or twice, or temporarily?

What was needed was an intelligent firewall that could outright block most ports, and open others only as required, and thus the *stateful firewall* was born. This particular invention made it so that incoming traffic destined for a machine on the network would be allowed in only if the target machine had first initiated contact. Sort of like a door that only opens when it's needed, and only from the inside.

The firewall does this by tracking the outgoing connections and comparing incoming connections against them. If the address and port of an incoming connection matches the address and port of an outgoing connection, the data transfer is allowed to go through.

Today, pretty much all firewalls are stateful – from those your ISP uses, to your router, to the software firewall on your PC. They make it possible to have good protection without sacrificing usability. And though they can't be easily abused, they can in some cases be bypassed.

Tricksy software

You might have had times when, setting up an FTP or game server, you had to tell your router or operating system's firewall to allow certain programs or services through. That's because, as it should, your firewall would see any incoming connections as a threat, and drop them.

Some of you may be familiar with the Hamachi software that lets you set up a VPN over the Internet at the touch of a button. It enables you, for example, to play games with your friends without the need to enter their IP address, or connect to them over a game browser. Instead, you select to play over a 'LAN', and voila, your mates' machine is detected as if it were on a LAN in the next room.

Hamachi makes playing networked games easy as pie but more importantly, if you're hosting a game, you don't need to open ports in your firewall. It just works.

And Skype, of course, helped the VoIP wave take off and now at any one time there are millions of users using it to call each other over the Internet. But once you've installed the software, you don't need to tell your firewall to let connections of people calling you in, they just work.

So how is it that another Hamachi user can connect to your machine, or a Skype user can call you, without ever telling your firewall to let them through?

How does Skype, like, completely ignore your firewall? It's not as complicated as you might think. For one, firewalls hate water. Yes, really.

Punching holes

No, they don't go all naughty and hack your machine – they don't have to touch your firewall at all. In fact, they actually do everything by the book.

Both Hamachi and Skype rely on the User Datagram Protocol, or UDP, for sending volumes of data. UDP is a great protocol for things like games and streaming audio because it's fast and fault tolerant – packets can go missing and it doesn't matter.

By using UDP it's possible to bypass a firewall. The process even has a name, *UDP hole punching*. Keeping in mind the boffins at Hamachi and Skype haven't revealed all their tricks, we do know that UDP hole punching is used to set up connections between peers. The question is: How do they bypass the firewall?

The key is the behaviour of a stateful firewall to allow incoming connections that were first initiated by outgoing communication. So, let's take two client machines using Hamachi by way of example. We'll call them 'Logan' and 'Craig'.

Craig sends a vitally important IM to Logan – 'I'm gonna pwn your ass in CoH. And get a haircut'. Logan responds eloquently in kind with 'Bring it on, girly man. And you first'. Naturally, the game is on. They both fire up Hamachi to create a VPN for Company of Heroes.

When Hamachi is launched, it logs you onto the central Hamachi servers and, in doing so, passes on your relevant network data – IP primarily, but also a preferred UDP port. At some stage, the Hamachi client is going to confirm with the server that a particular port is accessible (though communicating to the server with it), and this will be stored.

With both of them logged in, Logan selects to connect to Craig, and in doing so the Hamachi server swaps network data with the clients. Logan now has Craig's IP address and an accessible UDP port, and vice versa.

> **They don't go naughty or have to touch your firewall at all. In fact, they actually do everything by the book.**

But this doesn't mean the machines can talk just yet. Remember any connection from Logan to Craig will be dropped by Craig's firewall, because it's foreign and doesn't match up to any previously initiated connection.

Which is exactly what happens – Logan sends a packet to Craig's machine on the IP address UDP port given by the Hamachi server, and Craig's firewall drops it. But now Logan's machine has opened a connection to Craig's IP and port, and so the firewall is open to accepting a response from that same IP address and port. Essentially, Logan has punched a hole in his own firewall.

Thanks to the Hamachi server, Craig's machine has Logan's IP and the UDP port it used to try to connect to him. So now Craig initiates a connection to Logan, which because Logan's machine is anticipating a response to its earlier sent packet, is allowed through.

The two machines now have a direct peer-to-peer direct connection and the Hamachi server (at least for UDP traffic) is taken out of the loop. This leaves Logan and Craig free to fire up Company of Heroes and go on to demonstrate new levels of pwnage on each other. Just who exactly would win depends on who's editing this line before it goes to print (*Lucky for Craig, I have a bit of editorial integrity. But only a bit – Ed*).

So, in summary, the two machines manage a direct connection bypassing their firewalls by taking advantage of the stateful nature of modern firewalls, tricking them into accepting connections from a source they didn't initially contact.

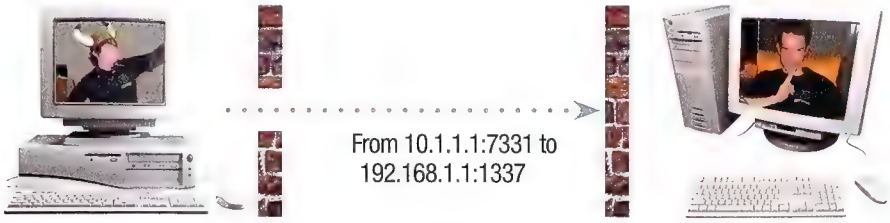
The real world

Obviously there are some caveats with UDP hole punching. The mechanism relies on UDP traffic, so any firewall blocking UDP prevents this loophole being used – but then, if UDP is blocked, you wouldn't be able to use software like Hamachi and Skype anyway.

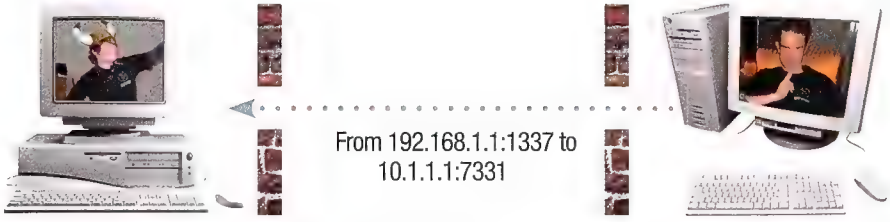
Next, if clients are having a hard time trying to connect (perhaps limited ports are available on a restrictive firewall), the central servers can act as a relay – the software will still work, but it will be slower and with greater overheads.

Finally, it does require a mediating server to work. If the Hamachi or Skype servers aren't up or accessible at the time a connection is made, no peer-to-peer connection can be established.

Still, all these conditions being met, UDP hole punching is a clean (if unsecure) means of bypassing firewalls.



Logan initiates a UDP connection to Craig at 192.168.1.1 on port 1337. Because it's an outgoing connection, Logan's firewall allows it through. Craig, however, doesn't recognise the source of the data, and drops it.



Craig, armed with Logan's network information, initiates a connection to 10.1.1.1 port 7331. Because Logan's firewall is expecting a response to come into port 7331 from a source of 192.168.1.1 port 1337, it allows Craig's data through, and the two machines talk to each other. It's important to note if the source or destination ports are different, the packets would be dropped. This is why a central server is needed to confirm on each client the IP and ports that will be used to connect.

Z-ACCESS

The big picture behind technology and the world around us

It's hard enough to climb mountains at the best of times, without having to lug great big weapons up those unforgiving slopes.

Scaling Mount XP

Can MMOs be separated from the daily grind? **Tim Dean** thinks they can.

It's a long way to the top, if you want to MMO. From the moment you create your first character, you find yourself at the base of a towering mountain, its distant misty peaks obscuring untold treasures.

Sure, the short trek to base camp up the gentle slopes of the foothills might not seem that difficult. But by the time you're half way up, doggedly gripping onto the ever-rising slope, you begin to realise what a monumental task you've embarked upon.

Mount XP is a mighty massif, and one not inclined to be conquered by the faint of heart. It's so big that some MMOs should come bundled with sherpas.

The theory is pretty straight forward; keep us playing that MMO as long as is humanly possible – or inhumanly possible in some cases. But the real trick is to create a game that carefully balances a solid pace of advancement with longevity, so we don't 'finish' it too soon.

How to do that? One obvious method, characteristic of traditional MMO theory, is to simply drag the game out. If the mountain isn't very tall, we'll be inclined to quickly scale it and move on. A larger mountain will take a longer investment in time to conquer, which equates to more revenue for the developer. However, if they make the mountain too big, there's a risk we'll lose sight of our objective and decide it's simply too much work to get there.

Does this method work? Recent research on World of Warcraft by Nick Yee (the brain behind the Daedalus Project – **www.nickyee.com/daedalus**) and the team at the Palo Alto Research Center, casts some doubt on the benefits of Mount XP. The research suggests that as many as 60 percent of WoW gamers drop out after only two months in the game. At the average rate of 10 hours of gameplay a week, that amounts to about 85 hours of play. Not bad, but that means most of them are dropping out at about level 30, or only half way up the mountain. And when asked about why they've quit, a majority report a lack of progress and grinding as being primary factors.

So we lose a few casual noobs on-route. So? It's the dedicated players who strive for the summit – and subscribe for well over a year – that count, yeah?

> "Mount XP is a mighty massif. It's so big that some MMOs should come bundled with sherpas."

Maybe not. According to Yee's research only around five percent of active WoW players were at level 60 (this is before the release of the expansion, The Burning Crusade), and only a tiny 3.6 percent actually participated in end-game content for more than one hour each month.

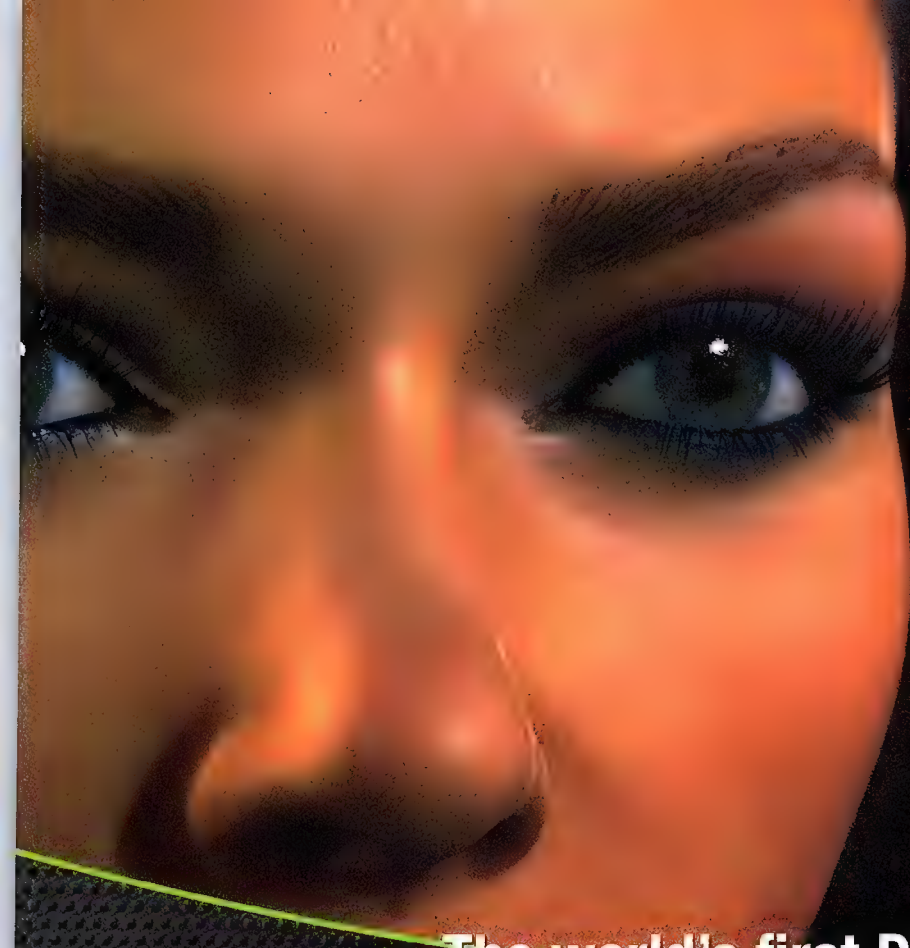
Let's say that this 3.6 percent are the type who will subscribe for two years. Given the typical two-month churn by casual players, this makes them worth as many as 12 casual players.

But there are 26 times as many casual players, making them over twice as significant in terms of revenue as hardcore players. If the MMO could keep these casual players hooked in for even three months instead of two, it would make a massive difference to the bottom line. Even if in doing so, the game was made less attractive to hardcore gamers.

To me, this makes a clear argument that the old thinking – of making Mount XP as big as possible to keep people from 'finishing' the game and moving on to *cough* Vanguard *cough* – is redundant. Instead, an MMO can be built so an average gamer, playing 10 hours a week, can reach the level cap in three to four months – rather than the six to nine months of WoW – and then the end-game content kicks in. This wouldn't necessarily preclude elite end-game content or PvP that would demand more time and effort, but it would rope in more people for longer, thus yielding greater revenues. And all by removing the grind.

And on that note, dear reader, it is with a great melancholy that I take your leave. This will be my final column for this esteemed magazine, as I head off to new pastures at *Cosmos* magazine. I'll certainly miss this crazy place, but I'm also looking forward to being on the outside, and enjoying it like a normal person. Tally ho!

With great sadness we suggest you email us instead of the wise goateed one.
editorial@atomicmpc.com.au



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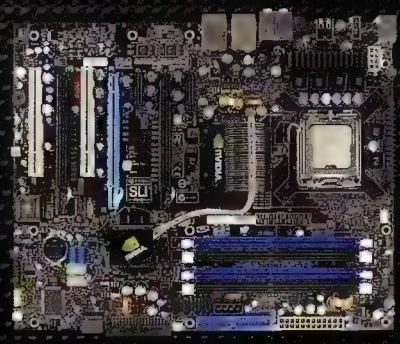

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BEATING THE BEAST

Craig Simms constructed a budget gaming PC that came close to kicking the butt of our high performance system. And now, he's going to show you how to do it.

We tend to bang on a bit at Atomic about the virtues of buying a high-end PC. After all, we're used to the simplicity high-end performance it brings, and love running our games at the fastest possible speed, with everything on, at the highest most insane possible resolution.

Just like our monitor roundup this month shows though, we realise the grim reality is that only a few of us can afford to lay out the claims to have one of these humming beasts of Power Drain +1 purring on our desks.

We also tend to focus a little more at the component level, rarely taking a holistic approach and asking what we're asking now: with the right parts, can we make a cheap system go as fast as a ridiculously high-end one? Can we spend $2000 instead of $4500 and still get there?

Before you stumble out of your seat screaming 'No!' like Darth Vader after a brief argument on a particularly hot and balmy day, we know right from the beginning that we won't be able to dominate a high-end machine, especially in the graphics card stakes. But what we can do is damn well try to get it as close as possible – while not breaking the bank – to see if it really is worth spending so much on the top-end parts that we just after every month.

Could it be we really don't need all that power after all? Could it be our bank accounts are finally safe? Could it be Logan is considering a haircut? Read on, dear reader, read on

THE CONTENDERS

In the blue corner is our test bench machine. An Intel Core 2 Duo X6800, EVGA 680i motherboard, ASUS 8800GTX graphics card, OCZ Flex XLC 9200 RAM and Western Digital Raptor 150GB hard drive.

In the red… well, we haven't built it yet.

First we need to hand pick our parts. While overclocking is always a guessing game as to how much performance you can exactly wring out of a particular part thanks to manufacturing tolerances, you can still reduce these risks by choosing parts that are known to overclock well.

As we've lately had a chance to play with a lot of Core 2 stuff, we have a good idea of what can be stretched – so let's start building our *David* to take on the *Goliath*. We haven't included a case or monitor – that much is up to you.

CPU

Intel Core 2 Duo E4300

Price **$255** Supplier **www.synnex.com.au**

It's 1.8GHz, 800MHz FSB compared to 1066, no virtualisation. The E4300 really is the baby of the Core 2 Duo family, but it holds a mammoth amount of overhead, allowing us to clock it almost twice as fast, beyond that of the default clocks of its hugely expensive counterpart.

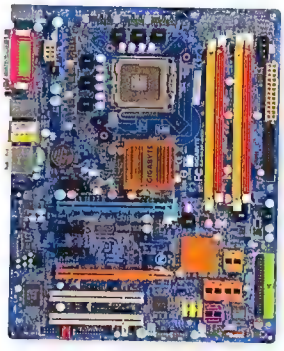
This chip is the new gamer's sweet spot.

MOTHERBOARD

Gigabyte GA-965P-DS3P v3.3

Price **$220** Supplier **www.gigabyte.com.tw**

With official support for 1333MHz FSB, the DS3P sports mean upgradeability, as well as belonging to Gigabyte's renowned overclocking series. It's a bit light on the accessories, but this helps to keep the cost down.



Alternatives If you don't want CrossFire, the GA-965P-DS3 is just as good and a little cheaper. Otherwise try the ASUS P5B for about the same price.

RAM

Corsair TWIN2X2048-6400C4 (4-4-4-12)

Price **$365** Supplier **www.altech.com.au**

This 800MHz RAM has been in the market for a long time, helping its price to stay low. Even better, if we relax the timings to 5-5-5-15, we can push it as fast as its $570 8500C5 equivalent if need be.

GRAPHICS CARD

Gainward 8800GTS 320MB Golden Sample

Price **$499** Supplier **www.australiait.com.au**

A pre-overclocked card? Hang with us here. These chips have already been filtered for the best quality that can be found, those that failed the test being relegated to service in a normal card. So even if you can only overclock it a little bit more, you at least have a guaranteed minimum overclock already for only a little more money, whereas vanilla cards are pot luck in this regard.

The DirectX 10 capability of the 8800 series means you'll also be futureproofed. While the 320MB edition might struggle with uber high-end textures at crazy resolutions, for the most part it performs on par with its 640MB sibling.

Alternative For futureproofing, you're better off getting the 640MB edition of the 8800GTS which will cope with newer games and larger resolutions a lot better. A Gainward Golden Sample edition will set you back about $680.

HARD DRIVE

Seagate 400GB 7200.10

Price **$210** Supplier **www.altech.com.au**

While Raptors may be fast, they're also bloody hot and if we're honest, need to be treated like a container of unstable plutonium to keep them alive during transport. Going for an alternative brings good enough speed for our needs, saves cash and adds capacity.

HEATSINK

Thermalright Ultra 120

Price **$80** Supplier **www.altech.com.au**

If you're going to be overclocking on a budget, that means air. And sweet holy schamoly, you won't find a better air cooler than this one.

FAN

Scythe S-Flex 120mm

Price **$29.95** Supplier **www.pccasegear.com.au**

Damned quiet, yet at 63.7CFM pushes 1.7 times as much air as the previous favourite, Nexus's Real Silent 120mm.

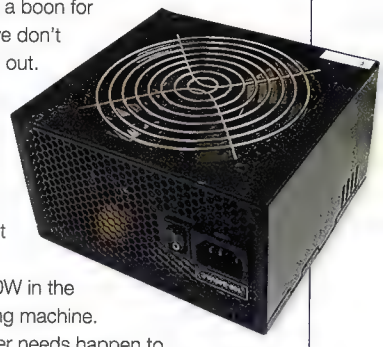
POWER SUPPLY

Seasonic 550W

Price **$200**

Supplier **www.powerhousepc.com.au**

Clean power is essential to overclocking, and quiet power is a boon for the ears, so we don't want to skimp out.



Seasonic is a master in both, and to be perfectly honest we probably won't not need any more than 550W in the average gaming machine.

If your power needs happen to be higher, then there are also 650 or 700W options available.

OTHER CONSIDERATIONS

Of course there's still an optical drive, case, monitor and input peripherals to be chosen, which will likely add another $500 to $1000. However as these can't so much be tweaked and mostly come down to personal preference, we'll leave these for you to decide on.

PARTS LIST

'Goliath' *Atomic* test bench	Street price	'David'	Street price
Intel Core 2 Duo X6800	$1500	Intel Core 2 Duo E4300	$255
EVGA 680i SLI	$425	Gigabyte GA-965P-DS3P v3.3	$220
OCZ Flex XLC 9200 (5-5-5-15)	$900	Corsair Twin2x2048-6400C4 (4-4-4-12)	$365
ASUS 8800GTX	$975	Gainward 8800GTS 320MB Golden Sample	$499
Western Digital Raptor 150GB	$350	Seagate 7200.10 400GB	$210
Thermalright Ultra 120	$80	Thermalright Ultra 120	$80
Scythe S-Flex 120mm	$29.95	Scythe S-Flex 120mm	$29.95
Seasonic 650W PSU	$235	Seasonic 550W PSU	$200
Total	$4494.95		$1858.95

As you can see, David is 59 percent cheaper than our test bench Goliath – more than half the price.

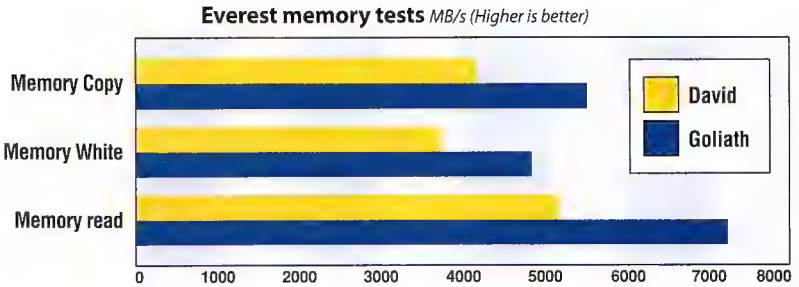
THE QUEST

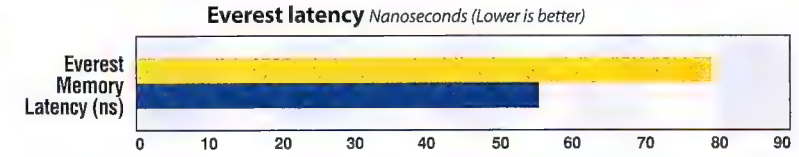
The question is, 'Is the performance also half that of its rival?' Time to get started on benchmarking both machines.

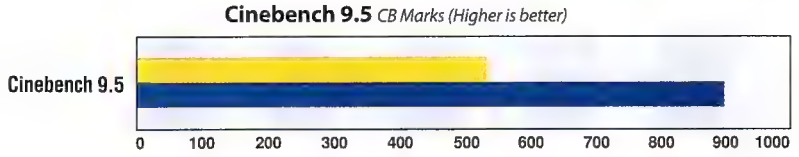
We assembled a cavalcade of benchmarks set to best represent an entire machine. First was Everest – we've found lately SiSoftware's Sandra has been providing some pretty inconsistent memory bandwidth figures, and so have opted to trial Everest – so far it seems a lot more stable in its results. As you can see Goliath walked all over our David here.

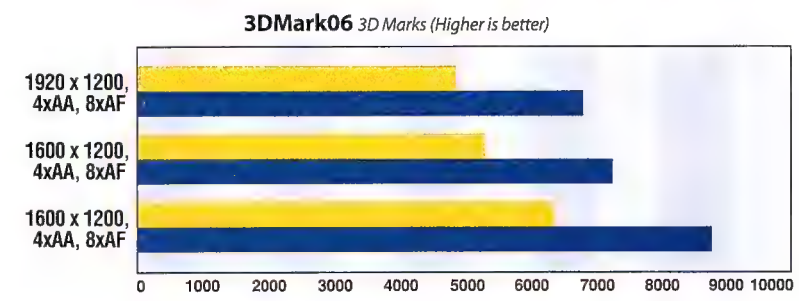
Secondly we wanted something that could give multi-core CPUs a run, so we employed Cinebench 9.5 – a cut down version of Maxxon's Cinema 4D which renders a preset 3D scene, using as many CPUs as you can give it. Since 3D rendering has been multi-core for many, many years

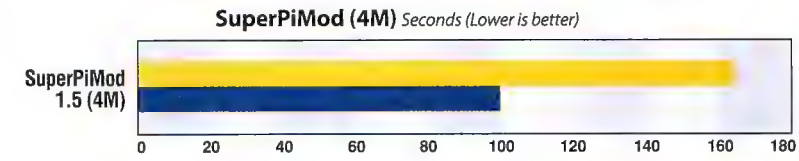
"As you can see, David is 59 percent cheaper than our test bench Goliath – over half."

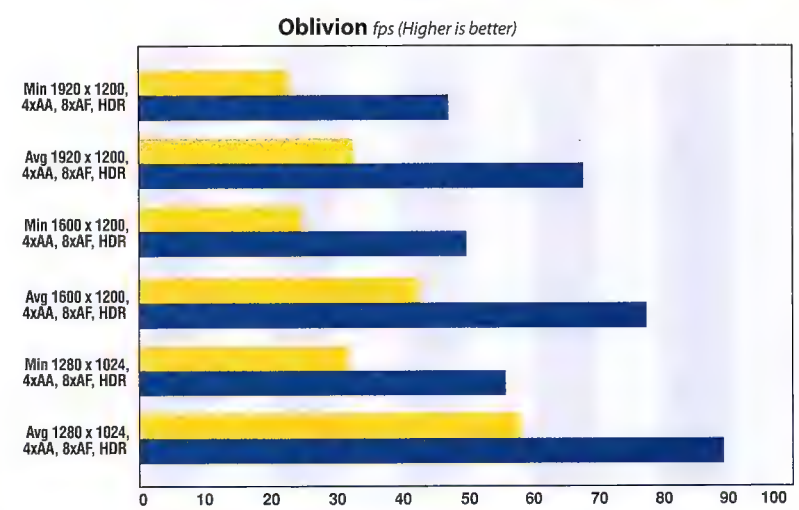


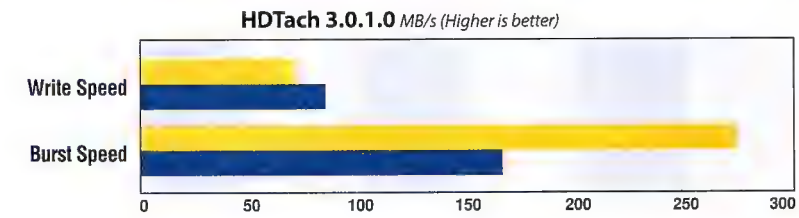












"The wonderful thing about the GA-965P-DS3P is... overclocking without having to touch the voltages."

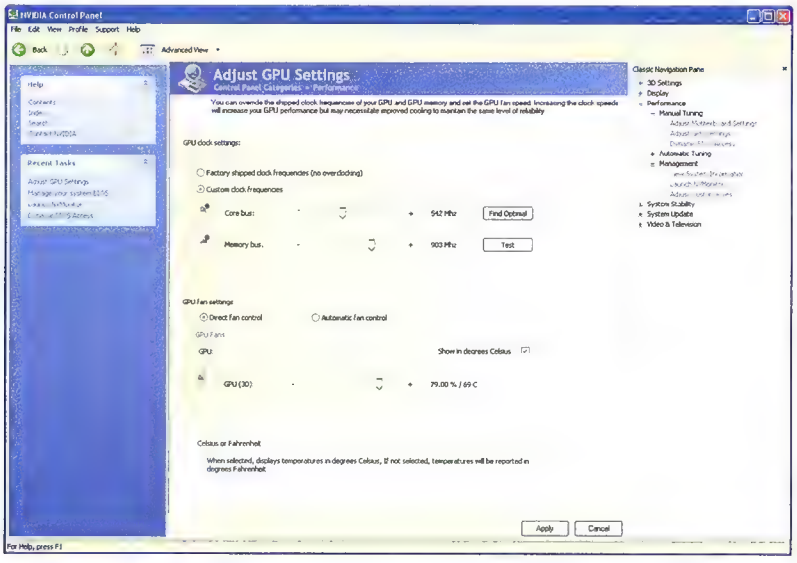
(yay renderfarms!) it's a great way to see how effective your CPU really is. Unsurprisingly since it's very CPU centric, once again the Goliath dominates due to its higher clockspeed.

SuperPiMod, while not massively multithreaded still does benefit from having more than one core. It's prevalence online also makes it a perfect choice for inclusion in the test benches to match up our contending machines. Our David is still breathless here, taking more than a minute longer to compute pi to four million places.

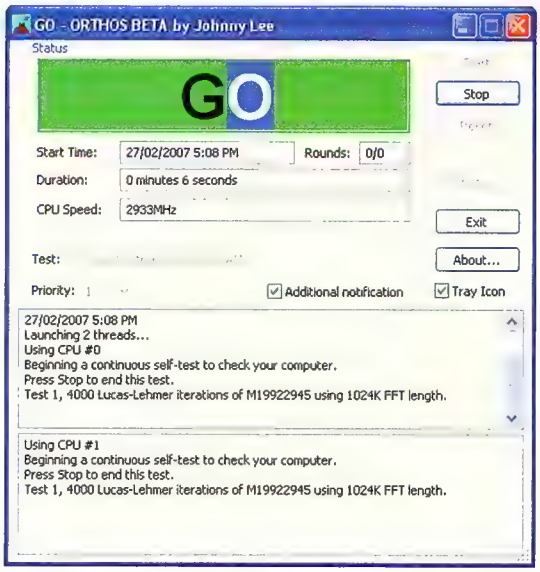
3DMark06 of course just can't be ignored – both because of its widespread use and because it offers both a CPU and GPU affected final score. Goliath wins again, its heavy hitting GTX and higher clocked CPU scoring a knockout blow.

For our game test we decided to pull out Oblivion, to really test both machines. A saved game was loaded and we ran around a set path each time, FRAPS benchmarking for three minutes. All settings were maxed out, with HDR turned on and since the 8800 series supports HDR with AA, 4xAA was forced on through nHancer (**www.nhancer.com**), an NVIDIA profiles tweaking tool. We recorded both minimum and average frame rates here. As you can see while the GTX laden machine dominated the whole way, the GTS struggled in resolutions above 1280x1024.

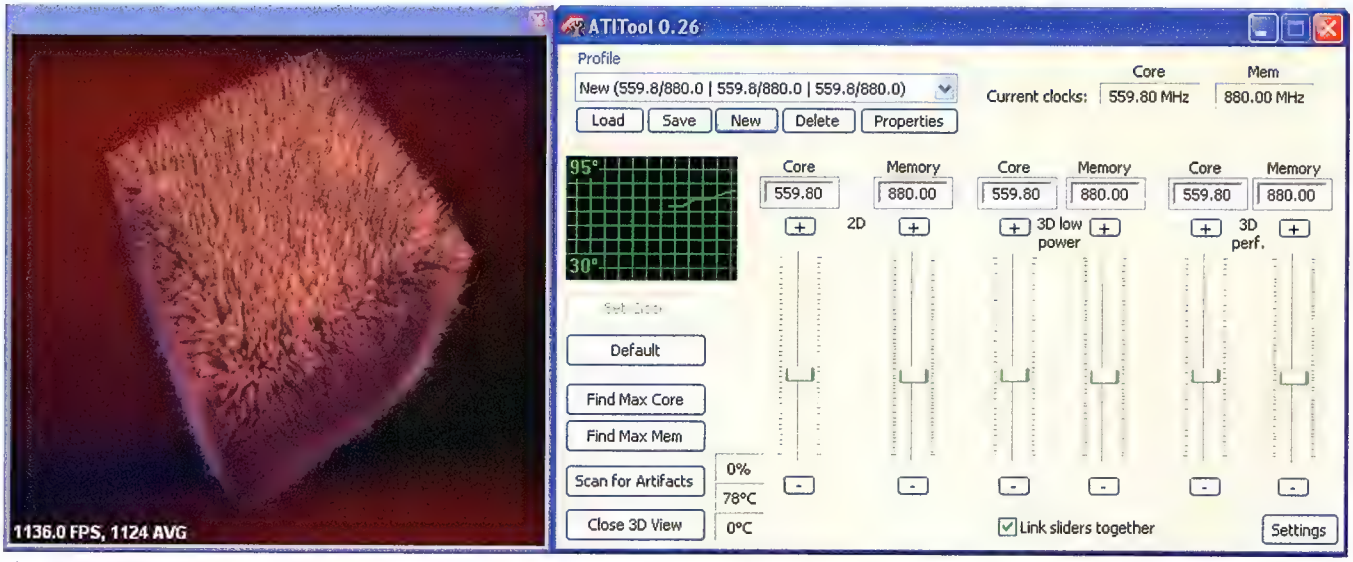
Sadly we can do nothing about the hard drive scores – the Raptor in Goliath is only SATA 1.5Gb/s, meaning its burst speeds are severely limited (David's only win in standard clock form, having a SATA 3Gb/s drive), however it makes up for this by having a sustained transfer rate of over 10MB/s more than the Seagate equivalent. We have included the graphs nonetheless so you can see that not going down the Raptor path is not such a huge sacrifice, however since the Seagate



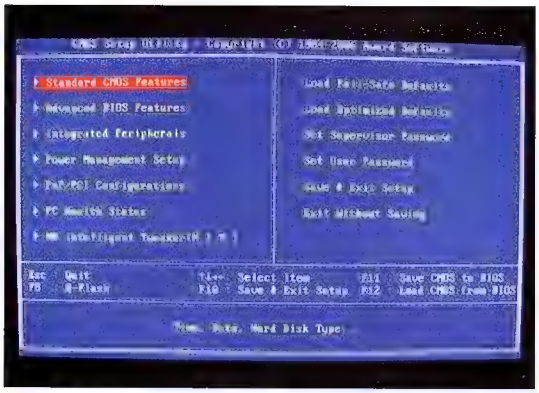
▲ **Set the fan to a permanent speed in nTune first. Note that you may need to set it twice, as nTune is a bit broken currently.**

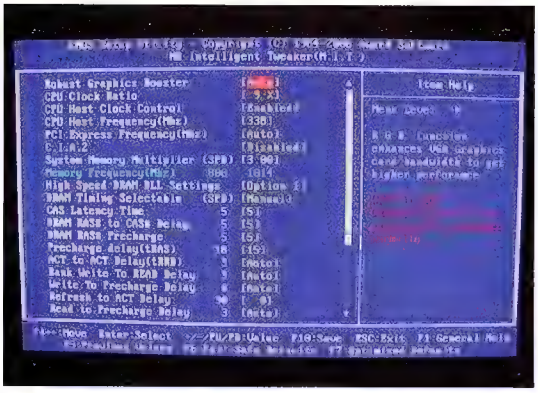


▲ **Orthos checks our overclock stability. Three successfully passed tests is a good sign.**

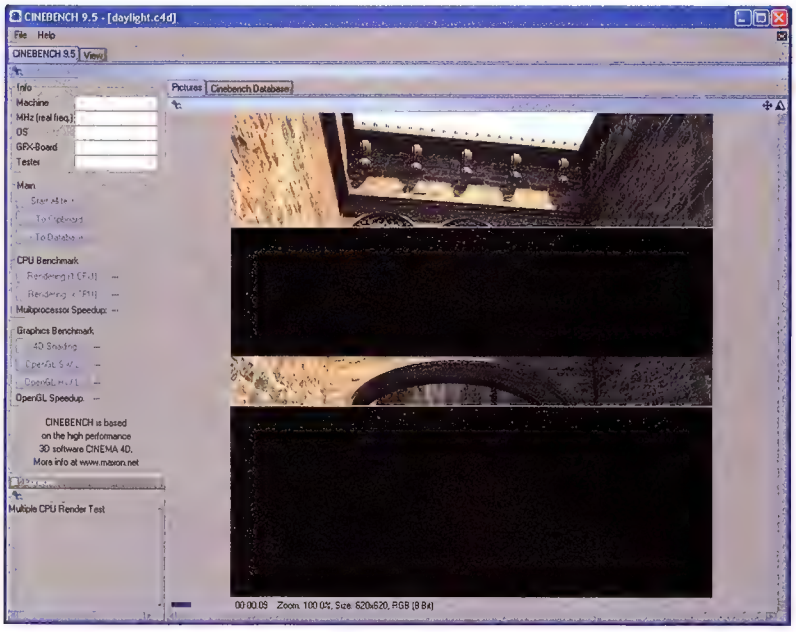


▲ **ATITool is our weapon of choice when it comes to overclocking video cards, as we don't have to use NVIDIA's slow 'test' method.**

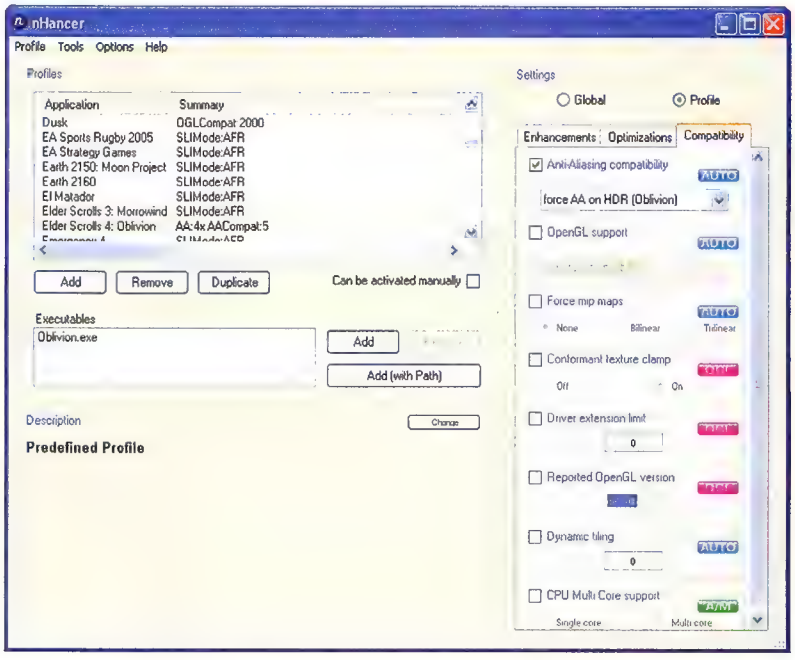




▲ **At the first BIOS screen, hit CTRL+F1, then enter MB Intelligent Tweaker. As you can see from the second screenshot, a whole host of new options open up, including RAM timings. Finally in Advanced BIOS features, turn off any of those annoying thermal throttling options Intel throws in. We want it to be faster, not slowed down!**



▲ **Cinebench 9.5 truly tests out the multithreading ability of a CPU.**



▲ **nHancer lets us run Oblivion with AA and HDR easily on GeForce 8800s.**

really can't be coaxed into going any faster, we won't be considering these results in our final analysis.

From a percentage point of view the graphs are interesting – on average the CPU benchmarks (SuperPi, Cinebench) are 70 percent as fast as our super machine, the memory latency (Everest) 69 percent as fast, the memory bandwidth (Everest) 74 percent as fast and the game tests (3DMark06, Oblivion) come in at 73 percent – giving an overall speed comparison of 71.5 percent. Not bad already for a cheap machine, but let's see if we can improve things a little. Time to start overclocking.

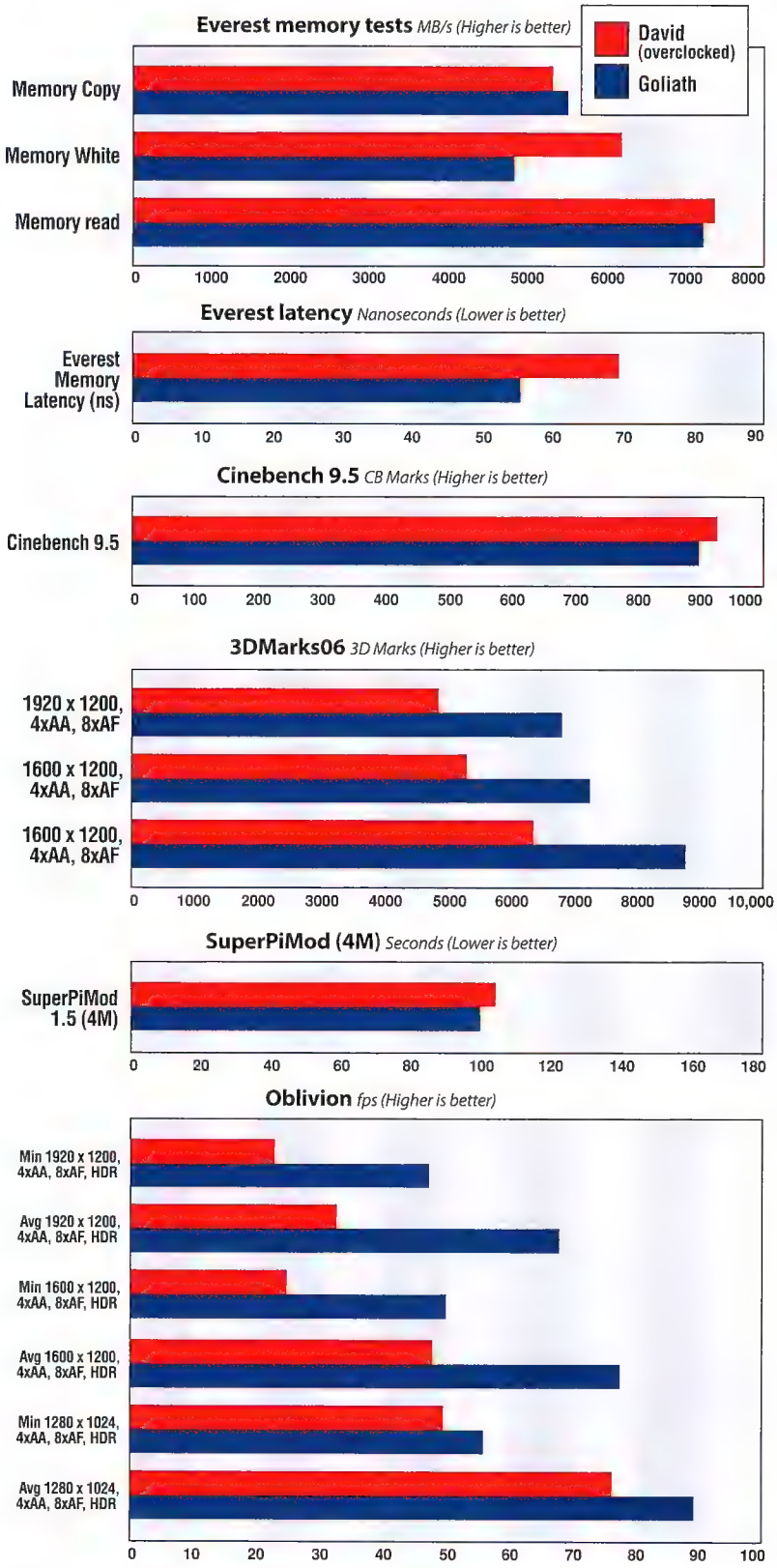
THE BIOS

The wonderful thing about the GA-965P-DS3P is its amazing tolerance for overclocking without even having to touch the voltages. After a lot of fine tuning pushing the FSB up slowly, we finally found the ceiling for our E4300 – a gob-smacking 3.1GHz. Unfortunately this was unstable in Stress Prime 2004 Orthos Edition, so we had to wind it down a little to 3.041GHz, resulting from a 338MHz FSB. A super tasty 1.241GHz overclock and faster than the default speed of our 2.93GHz X6800, at a $1245 discount.

By hitting Ctrl+F1 in the Gigabyte BIOS and going into the MB Intelligent Tweaker menu, RAM timings are opened up. With a bit of patience we were able to push the Corsairs to 1014MHz at a timing of 5-5-5-15, setting a ratio of FSB:RAM at 2:3 (3.00 memory multiplier in the Gigabyte BIOS). Check the screens on this page for all the settings we used. Mind you at this rate the sticks get very hot – while they seemed to handle the extra thermal energy just fine, you may want to ►

consider setting up some kind of active cooling above them, just to ward off any possible problems.

None of this tweakery required any voltage changes. In fact increasing the voltages didn't give us any more mileage at all, showing that Gigabyte is 100 percent on top of the game when it comes to overclocking and the 965 series of boards. Major kudos to them, especially with the 2.0 and 3.3 revisions.



▲ **The overclocked system fared a lot better, only really being pipped in the graphics stakes. RAM and CPU went off the charts.**

THE GRAPHICS

Grabbing the latest nTune from NVIDIA's website, we set the 8800GTS 320MB's fan permanently to 79 percent speed – a level that brings a perfectly acceptable amount of noise, but while offering some extra cooling. Note that you may have to set the speed and apply it twice – there seems to be a bug in nTune currently that stops you setting it first time.

Downloading ATITool 0.26 (which works just fine with NVIDIA cards – grab it from **www.techpowerup.com/atitool**) to give us greater overclocking flexibility, we set the artefact scanner going, watching for any little yellow lines that may appear. After a few false starts and machine lock-ups, we managed to hit a stable 625MHz core and 932MHz memory from the already overclocked 550/880, and thanks to the constantly going fan managed to keep the temperature under 76°C when under load. Not a bad increase at all from the original GTS's speed of 500/800.

THE RESULTS

So what does this mean versus our original results? Just look to the left. Wow – what an improvement. The CPU tests come in at three percent *faster* than Goliath on average. Memory bandwidth is eight percent faster than the test bench, and latency bumped up to 79 percent as fast. The game tests on average weighed in at 87 percent of the speed of Goliath, up from the prior 73 percent. This brings us to an insane average of 94.25 percent as fast as Goliath within our total test suite, for less than half the price. Bargain? You bet!

MAKING THINGS BETTER

There are a few weak points that have been shown up by the benchmarks that can be fixed if you're willing to part with more cash.

Despite being clocked faster than the X6800, the overclocked E4300 fails to beat it in SuperPi – suggesting the benchmark is sensitive to memory latency. Lower latency, higher speed RAM could fix this if your dollar can stretch a lot further, although we'd suggest the extra cost isn't worth it.

Obviously the biggest gap is in the GPU side. The 320MB 8800GTS struggled with higher resolutions in Oblivion, although to be fair we were heavily taxing it with HDR, 4xAA and 8xAF with everything on. Opting for the 640MB version should see the minimum frame rates rise nicely. Still, it's no substitute for a GTX.

Finally while we can't overclock hard drives, we can easily surpass a single Raptor by using RAID 0. Just don't trust that drive as a storage drive, because if you lose one drive you'll lose all your data that's spread across both. A pair of 250GB 7200.10 drives will set you back about $230, and if you add another storage drive for safety you're set.

No matter what your final configuration, you're still paying significantly less for a machine that's not so far away from the very top. Now doesn't that make you feel warm and fuzzy inside?

Choose Wide!!

Splendid Widescreen LCDs from ASUS

With the newly released Microsoft Vista™ operating system supporting widescreens and the increasing multimedia requirements of todays' users, the LCD display market is migrating towards higher resolutions and wider screens. Widescreens is the name of the game today, when it comes to comfortable viewing and picture quality. ASUS has a large range of widescreen LCDs which offer unique benefits to customers.

MW22 and MW20 - 2ms response, HDCP technology & Vista Premium Certification

The 22" MW22 and 20" MW20 delivers high 1680x1050 resolutions while its wide screen size equals two A4 sized pages side by side, meaning ample screen space for opening multiple applications and viewing windows. Trace Free Technology accelerates response time to 2ms, the fastest among 22" widescreen LCDs, to eliminate ghosting and video delays during movies or games. Teamed with HDCP support via DVI input, the MW series ensures video signal integrity, security and image representation quality. Business & consumers also benefit from the Vista Premium certification allowing for high-quality when used with a Vista PC. Additional stereo speakers and earphone jacks complete this vibrant multimedia LCD range.

VW192 - 19" widescreen for work and entertainment

The VW192 19"wide LCD offers wide viewing angle, 5ms response time, 330-nit brightness and 800:1 contrast ratio (max.). Built-in stereo speakers, found in VW192T and VW192S, are included to deliver a video display solution that is also capable of high-quality audio experience. The stylish contour and detachable base for easy wall mount make the VW192 suitable for both home and office usages.

PW191 and PW201- Premium Luxury Widescreens with 1 Year Bright Pixel Policy

The 19"Wide PW191 was created with viewing comfort in mind with a glossy colourshine panel that offers rich video display with powerful integrated audio speakers. The PW201 is an 20" glossy wide Audio Visual powerhouse with built-in webcam, speakers, rich audio and video inputs, USB and picture-in-picture function as well. Hook up your DVD Player or Set-top box to watch TV and movies. Plug in your Ipod, XBox or PS3. It is not just a display, but an out-of-the-box video conferencing solution as well.

The brushed aluminum pivot neck enables easy adjustment of swivel, tilt angle and height for users comfort

Trace Free Technology accelerates response time to 2ms, the fastest among 22" widescreen LCDs, to eliminate ghosting and video delays during movies or games.

Both these premium LCDs, sport a unique brushed-aluminum stand allowing users to swivel, tilt and adjust height for comfortable viewing. In addition Pivot support permits display rotation for both landscape (for movies, Excel) and portrait (for photos, website browsing, software programming, billboard) viewing. Touch-sensor buttons allow for a fantastic luxury feeling at the touch of a finger. ASUS offers customers peace-of-mind with a 1 Year Zero Bright Dot Pixel Policy.

Why Widecreen?

Advantage 1: Most comfortable to human eyes

Widescreen offers the most natural and comfortable display format, because the viewing angle of human eyes is naturally wider horizontally than vertically. 20" widescreen with roughly the same height as a 17" monitors, offers 28% more viewing space while 22" widescreen offers about 27% more display than 19" standard LCDs. So in short, 20" & 22" wide LCDs take up similar workstation space, offer superior display resolutions and better viewing comfort.

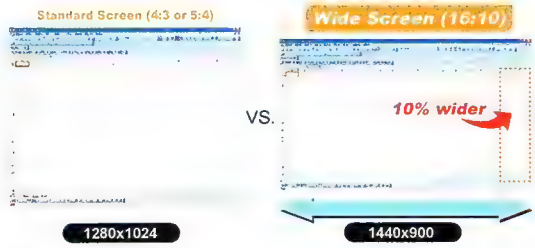
Advantage 2: Theatre-level experience

Widescreens are made for 16:9 DVD formats and can deliver excellent image quality even as the display becomes larger. Video images fit perfectly on the screen without large empty black spaces and distortions.

Video images fit perfectly on the screen without large empty black spaces and distortions.

Advantage 3: Increase productivity with larger space and Microsoft Vista

Widescreens are perfect for working on large spreadsheets, multiple windows, or two A4 size documents displayed side by side. Microsoft's Vista capitalises on widescreen technology to offer Windows Sidebar with gadgets, Flip 3D and tabbed browsing & live previews. Choose wide and view more.

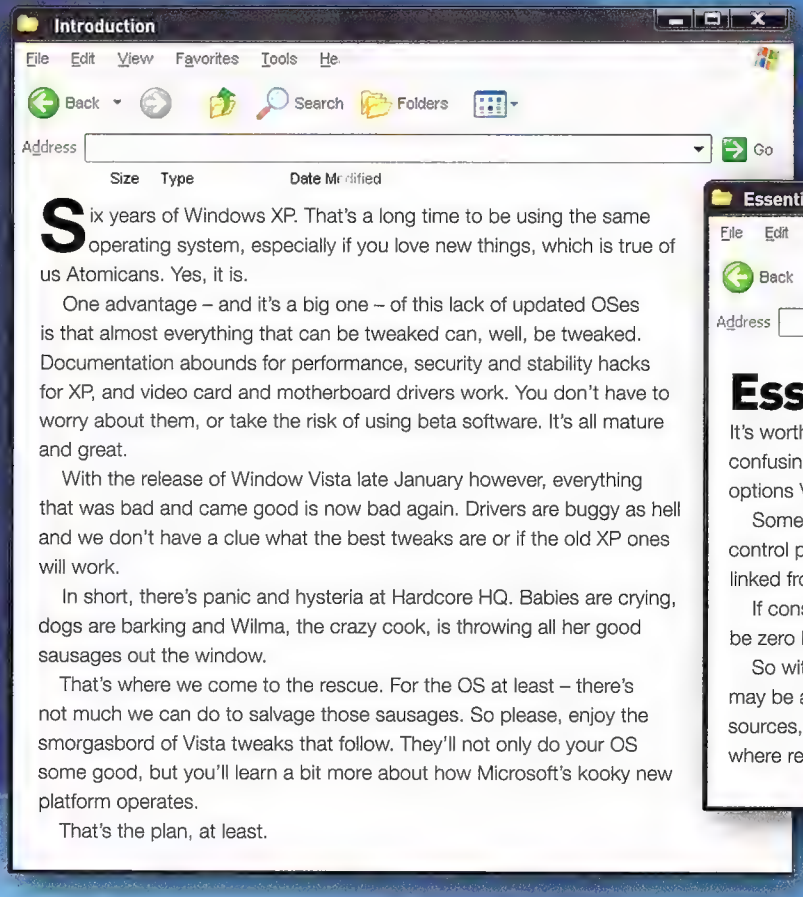


Widescreen offers more space

Advertisement

A better Vista

Vista may be all new and shiny but like its predecessors, is made for the masses. This means it's not tailored to the techies – honest, hard-working, hardcore geeks like us. So Ashton Mills set out to fix it.



Six years of Windows XP. That's a long time to be using the same operating system, especially if you love new things, which is true of us Atomicans. Yes, it is.

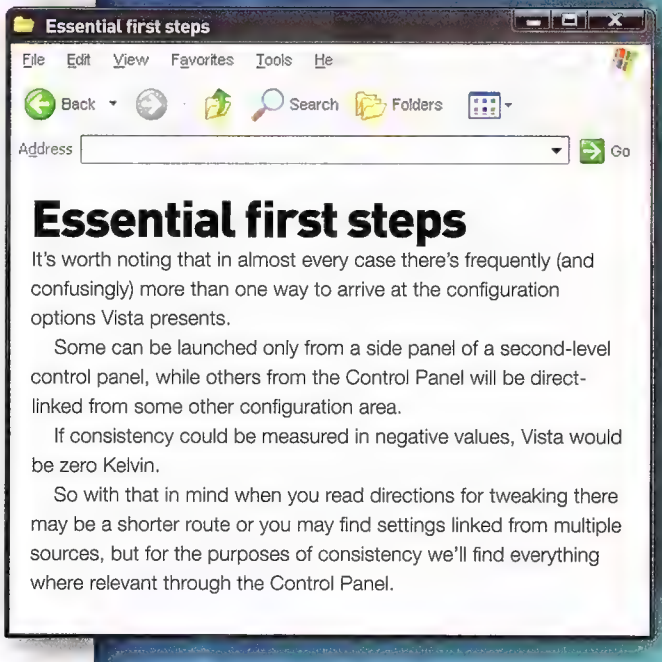
One advantage – and it's a big one – of this lack of updated OSes is that almost everything that can be tweaked can, well, be tweaked. Documentation abounds for performance, security and stability hacks for XP, and video card and motherboard drivers work. You don't have to worry about them, or take the risk of using beta software. It's all mature and great.

With the release of Window Vista late January however, everything that was bad and came good is now bad again. Drivers are buggy as hell and we don't have a clue what the best tweaks are or if the old XP ones will work.

In short, there's panic and hysteria at Hardcore HQ. Babies are crying, dogs are barking and Wilma, the crazy cook, is throwing all her good sausages out the window.

That's where we come to the rescue. For the OS at least – there's not much we can do to salvage those sausages. So please, enjoy the smorgasbord of Vista tweaks that follow. They'll not only do your OS some good, but you'll learn a bit more about how Microsoft's kooky new platform operates.

That's the plan, at least.



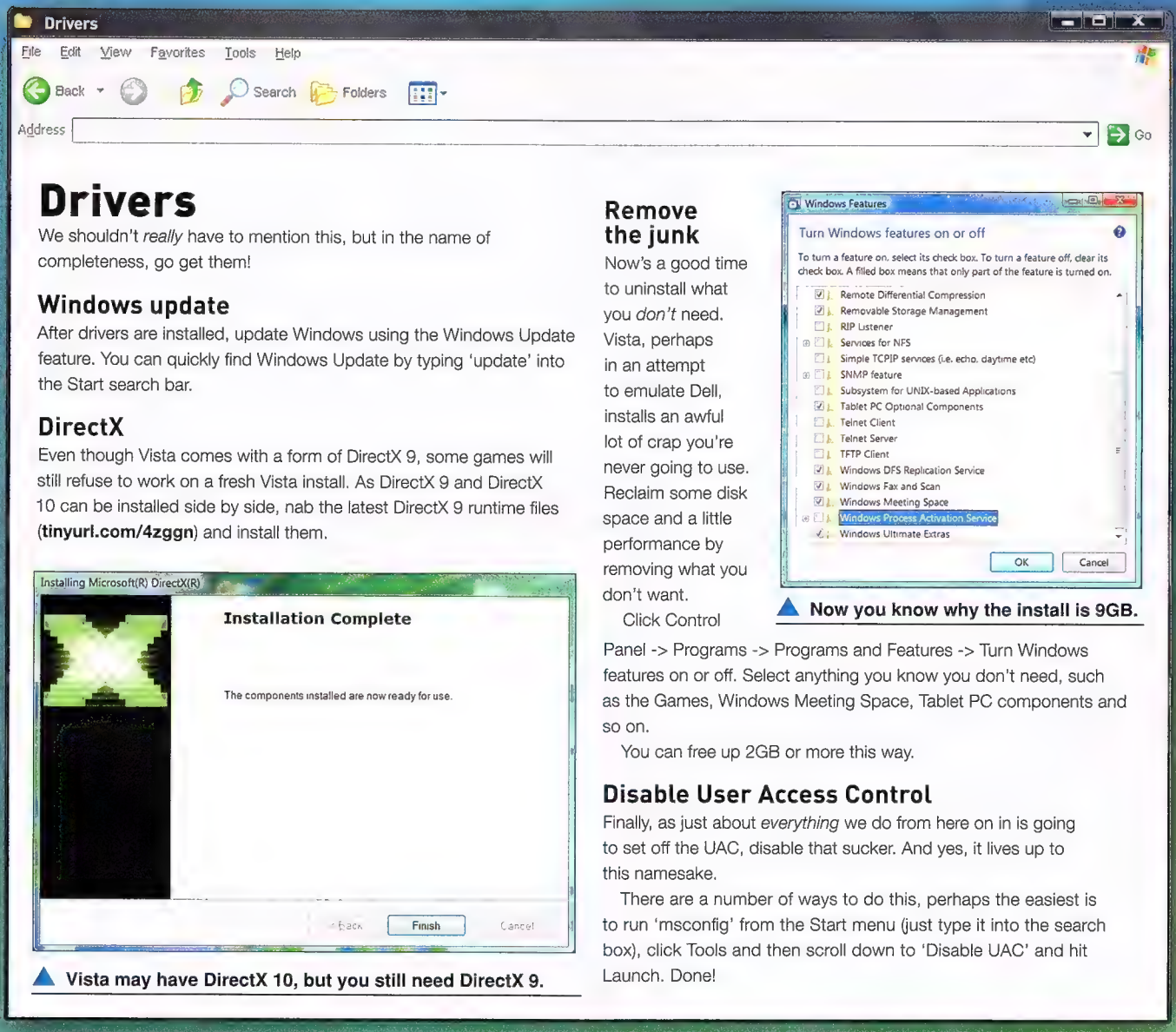
Essential first steps

It's worth noting that in almost every case there's frequently (and confusingly) more than one way to arrive at the configuration options Vista presents.

Some can be launched only from a side panel of a second-level control panel, while others from the Control Panel will be direct-linked from some other configuration area.

If consistency could be measured in negative values, Vista would be zero Kelvin.

So with that in mind when you read directions for tweaking there may be a shorter route or you may find settings linked from multiple sources, but for the purposes of consistency we'll find everything where relevant through the Control Panel.



Drivers

We shouldn't *really* have to mention this, but in the name of completeness, go get them!

Windows update

After drivers are installed, update Windows using the Windows Update feature. You can quickly find Windows Update by typing 'update' into the Start search bar.

DirectX

Even though Vista comes with a form of DirectX 9, some games will still refuse to work on a fresh Vista install. As DirectX 9 and DirectX 10 can be installed side by side, nab the latest DirectX 9 runtime files (**tinyurl.com/4zggn**) and install them.

Vista may have DirectX 10, but you still need DirectX 9.

Remove the junk

Now's a good time to uninstall what you *don't* need. Vista, perhaps in an attempt to emulate Dell, installs an awful lot of crap you're never going to use. Reclaim some disk space and a little performance by removing what you don't want.

Click Control Panel -> Programs -> Programs and Features -> Turn Windows features on or off. Select anything you know you don't need, such as the Games, Windows Meeting Space, Tablet PC components and so on.

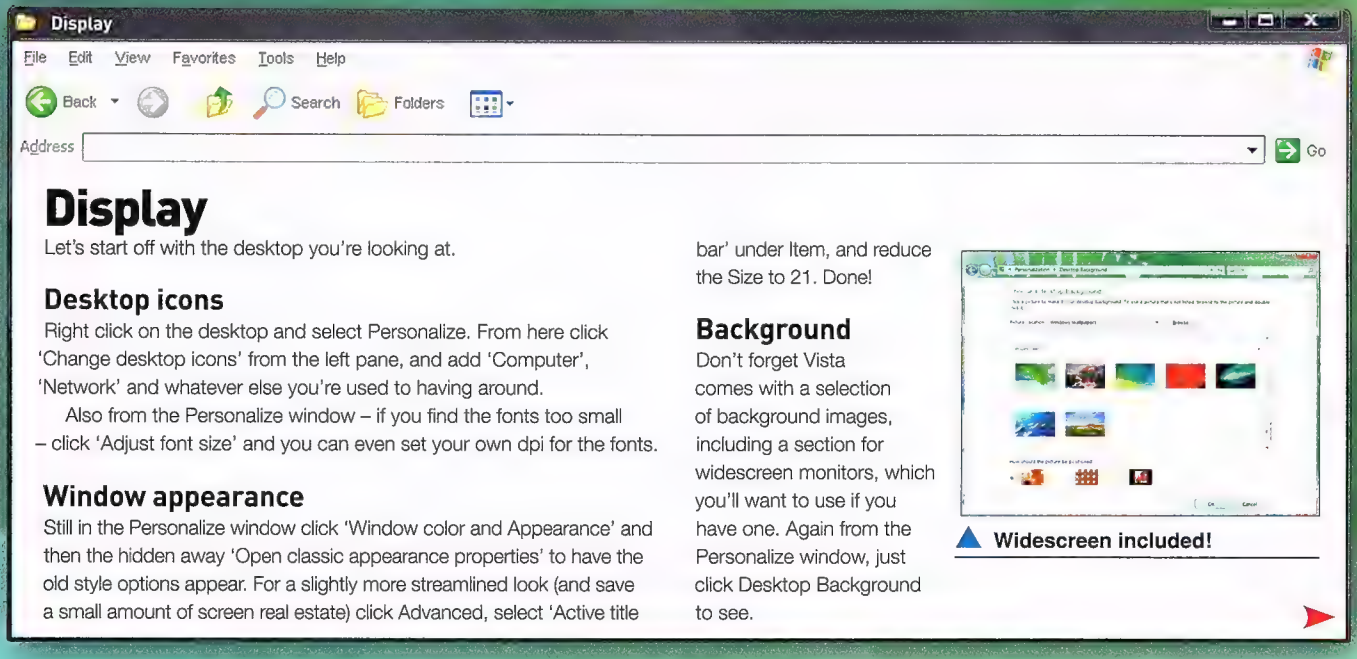
You can free up 2GB or more this way.

Now you know why the install is 9GB.

Disable User Access Control

Finally, as just about *everything* we do from here on in is going to set off the UAC, disable that sucker. And yes, it lives up to this namesake.

There are a number of ways to do this, perhaps the easiest is to run 'msconfig' from the Start menu (just type it into the search box), click Tools and then scroll down to 'Disable UAC' and hit Launch. Done!



Display

Let's start off with the desktop you're looking at.

Desktop icons

Right click on the desktop and select Personalize. From here click 'Change desktop icons' from the left pane, and add 'Computer', 'Network' and whatever else you're used to having around.

Also from the Personalize window – if you find the fonts too small – click 'Adjust font size' and you can even set your own dpi for the fonts.

Window appearance

Still in the Personalize window click 'Window color and Appearance' and then the hidden away 'Open classic appearance properties' to have the old style options appear. For a slightly more streamlined look (and save a small amount of screen real estate) click Advanced, select 'Active title bar' under Item, and reduce the Size to 21. Done!

Background

Don't forget Vista comes with a selection of background images, including a section for widescreen monitors, which you'll want to use if you have one. Again from the Personalize window, just click Desktop Background to see.

Widescreen included!

Interface 1/2

File Edit View Favorites Tools Help

Back Search Folders

Address Go

Interface

You spend all of your time using it, so let's improve how it works!

Sidebar

Pretty, isn't it? Pity it sometimes tries to pop up in the foreground while playing some games. Disable it from starting by right clicking on it, -> Properties and de-select 'Start Sidebar when Windows starts'.

Menu speed

The menushowdelay trick from XP applies just the same in Vista. Click Start, type in 'regedit' and alter the following key:

```
[HKEY_CURRENT_USER\Control Panel\
Desktop]
"MenuShowDelay"="0"
```

Menu searches

While you're in the registry you can speed up the new Start Menu search to apply only to installed applications by telling it not to include local files:

```
[HKEY_CURRENT_USER\Software\Microsoft\
Windows\CurrentVersion\Explorer\
Advanced]
"Start_SearchFiles"=dword:00000000
```

Disable taskbar grouping

Right click on the Taskbar -> Properties, de-select 'Group similar taskbar buttons'.

Disable Windows Security Center notifications

Right click on the Security Center icon and select Open. On the left pane click 'Change the way security center alters me', and choose 'Don't notify me and don't display the icon'.

Increase or decrease Flip3D windows

In the registry, head to the following key:

```
[HKEY_CURRENT_USER\Software\Microsoft\
Windows\DWM]
```

Then right click in the right pane and select New -> DWORD. Give it the name 'Max3Dwindows' and set it to whatever value you like in decimals. Change will take effect at next Windows restart.

Enable aurora boot screen

The animated loading screen is nice, but there is an alternative. Start msconfig from the Start search bar, then click Boot and tick 'No GUI Boot'.

Disable problem reports

Second only to UAC in annoyance, and sending data off to Microsoft as it runs, is the automatic search for problem reports and resolutions when an application crashes, usually preventing you from getting on and closing the thing. Disable with Control Panel -> System and Maintenance -> Problem Reports and solutions, then click 'Advanced settings'. Under 'For my programs, problem reporting is:' tick 'Off', thank you very much.

From sleep to shutdown.

Make the Start Menu power button shutdown

By default, clicking the gold power button in the start menu tries to put your system to sleep (which doesn't work with many systems anyway) and you need to click the arrow and then Shutdown to actually turn your PC off.

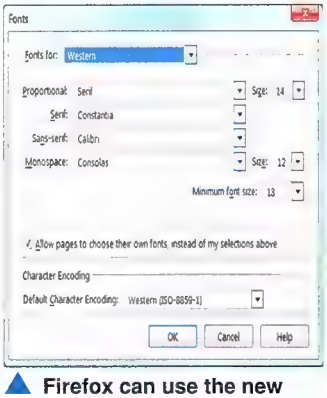
Turn that sleep button into a shutdown button by clicking Control Panel -> System and Maintenance -> Power options. Select the plan you're using ('High performance' for an Atomican, right?) then click 'Change plan settings'. On the next screen, click 'Change advanced power settings' and then finally scroll down to 'Power buttons and lid' and change 'Start menu power button' to 'Shutdown'. How's that for obfuscation of configuration? With all the work it took to get here, you might as well ensure that 'Power button action' is set to 'Shutdown' as well.

Update Manager

The Update Manager is nice and all, but it's a pain always seeing those updates you don't need to install (like the language packs). Hide unnecessary updates by right clicking on them and choosing 'Hide'.

Set Firefox to use new Vista fonts

The new fonts in Vista are definitely an improvement – and there's nothing stopping you using them in Firefox too. In Firefox under Options -> Content -> Fonts & Colors try using 'Constantia' for Serif, 'Calibri' for Sans-serif, and 'Consolas' for Monospace. There's also 'Candara', 'Cambria', 'Corbel' and 'Segoe UI' to play with.



Firefox can use the new fonts too!

Set global folder view

Vista has a lot more options for how you display your folders – play around with it and explore features like the new view modes or the realtime preview (click Organise -> Layout -> Preview pane).

Once you've decided on your preferred default view, press the Alt key. You'll see the old Explorer menu bar pop up, then click Tools -> Folder Options -> View. Now, let's add some more detail:

- Enable Show hidden files and folders
- Disable Hide extensions for known file types
- Disable Hide protected operating system files
- Enable Launch folder windows in a separate process

Interface 2/2

File Edit View Favorites Tools Help

Back Search Folders

Address Go

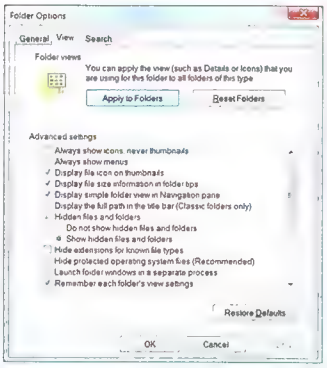
Interface (conituned)

Then click 'Apply to all folders'. Finally if you want to set a specific folder to use a different view in future, set it up how you like and then Shift-click close it and its view style will be stored.

One-click interface

This may not be your can of Coke, but give it a try and see if you like it. After all, double-clicking is so passé. Enable a one-click interface in three easy steps:

1 While in Explorer hold down Alt again, select Tools -> Folder Options. Select 'Single click to open an item' then 'Underline titles consistent with my browser'. What the? Bear with us.



Information is power, show me more information!

2 Now click Control Panel -> Network and Internet -> Internet Options -> Advanced. Scroll down until you find 'Underline links', and select 'Never'.

3 You now have a one-click interface, but it may feel a little un-responsive. No, it's not your hardware – it's the in-built mouse click delay speed. Click Control Panel -> Hardware and Sound -> Mouse Properties. Under 'Double Click speed', set it to 'Fast'. Remember, you don't need to double-click any more.

And you're done! Now your desktop just got a whole lot easier. There's just one caveat for the one-click interface: when selecting groups of files, instead of first selecting your file then Shift-clicking, hold down Shift before clicking on the first file instead.

Performance 1/2

File Edit View Favorites Tools Help

Back Search Folders

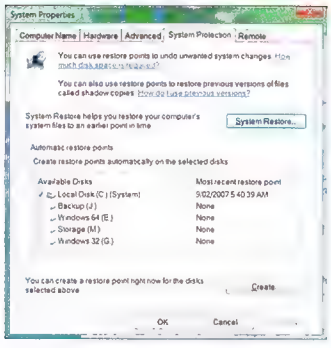
Address Go

Performance

Just about everything in this guide will help performance, especially disabling services (see the Services section) but there are some specific tweaks we can focus on too.

Disable System Restore and Shadow Copy

System Restore is one of those insurance policy technologies – probably a life saver if you ever need it, but in the meantime it bogs down your system. Shadow Copy more so, except Shadow Copy is actually quite a cool feature – being able to recover deleted files is a handy thing, even if it is only a snapshot of a particular time period.



Disabling drive hogging System Restore.

Although it's not spelled out in Vista's dialogs, the two are linked and Shadow Copy depends on System Restore being enabled to work. So think about if you want to disable it or not.

If you're happy to do without both, you can disable System Restore (and later Shadow Copy in the Services section) like so: Go to Control Panel -> System and Maintenance -> System -> Advanced system settings -> System Protection. Then, deselect all your drives from the list. Not only will this speed up your system a little, it'll also free up the disk space already being used by System Restore and Shadow Copy.

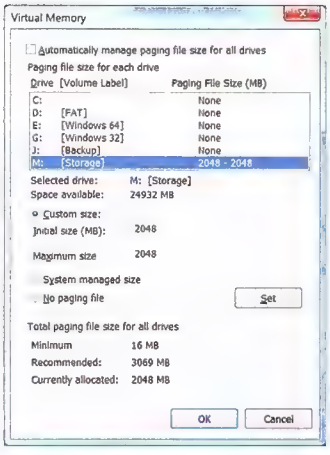
Recycle Bin

On a similar note, even if you keep System Restore and Shadow Copy enabled, you can a least kill off the Recycle Bin. Simply right click it and choose 'Do not move files to the recycle bin' for all your drives. As a result, it's usually good to leave 'Display delete confirmation dialog' enabled, just so you don't go accidentally deleting something.

The pagefile

Some wisdom never goes out of fashion, and when it comes to managing Windows' pagefile the same rules apply as with XP. Follow Control Panel -> System and Maintenance -> System -> Advanced system settings -> Performance -> Settings -> Advanced. Under Virtual memory, click Change.

There's a few basic rules here – first the myth of twice your system's RAM is exactly that, a myth. If you think you need to make a 4GB swapfile for your 2GB memory system, you're mad. Logically the more memory you have, the less swapfile you need.



Some things just never change.

Vista, bless it, is a big fat beast and so will eat up more of your memory than XP. So a good hard, fast rule here is, regardless of how much RAM you have installed, set the pagefile to 2GB min and max, and be done with it. The only other thing to consider is, if possible, put it on a separate drive but only if this drive is equal to or faster than your Windows drive. If you can't, don't worry.

Performance 2/2

File Edit View Favorites Tools Help

Back Search Folders

Address Go

Performance (continued)

Disable search indexing

Granted it'll make searches slower when you go to do them, but it'll help reduce disk thrashing when the index is being updated (seemingly at every boot). Simply right-click on a drive and uncheck 'Index this drive' to disable it.

IPv6 and QoS

There's a gigantically large chance you're not using IPv6, and won't for a while yet. Disable it, and the default QoS which you don't need either, like so: Control Panel -> Network and Internet -> Networking and Sharing center -> Manage network connections from the left side pane. Right click on your NIC and select Properties. De-select IPv6 and QoS, and hit OK.

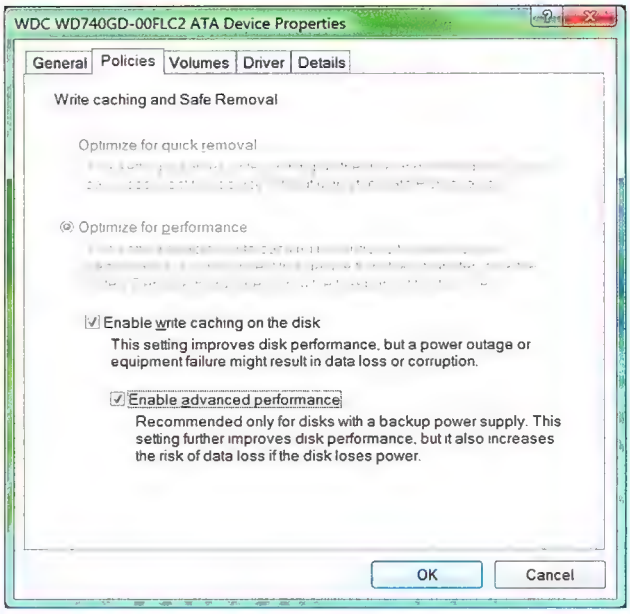
Additionally there's more that can be done to improve network performance involving disabling services and the firewall, which are covered in the Services and Security section of this guide.

Disable offline files

Unless you're in an office environment offline files won't do much for you and it's one more service you don't need running. Hit Control Panel -> Network and Internet -> Offline files and click 'Disable offline files'.

Advanced Performance

Digging up the Device Manager is a little harder than before, but you'll find it in Control Panel -> System and Maintenance -> System -> Device Manager from the left pane. Once there, drill down to your hard drives under 'Disk drives' and, depending on your drives and drivers, you may find the 'Advanced Performance' option, an extension of the write-back caching, though you may want to heed the warning.



Can improve performance, but not for everyone.

Disable and delete hibernation file

If you prefer clean boots and you're not using a laptop, you don't need this, especially as the hibernation files sucks up as much disk space as you have system memory.

Click Start and in the Search Bar type 'cmd.exe'. In the command prompt type 'powercfg -h off'. Removing the hibernation file can be part of an extensive cleanup, in the next tip, if you don't remove it manually.

Extensive disk cleanup

If you click Start -> All programs -> Accessories -> System tools -> Disk cleanup and select a drive you'll get the old disk cleanup dialog from XP for clearing out common unused files. This still works as before, but you can get a more extensive set of options with the following: from the Start Search Bar type in 'cmd.exe' followed by 'cleanmgr /sageset:1'.

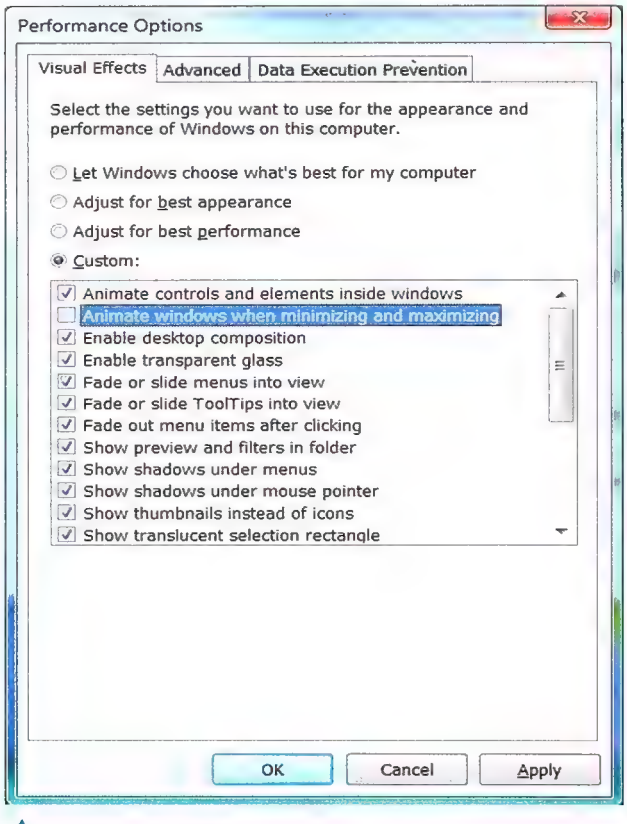
The disk cleanup dialog will appear, this time with a wider range of options. Select the categories of files you want removed, then click OK. These are saved in numbered profiles, which you can execute with: 'cleanmgr /sagerun:1'.

Explorer performance

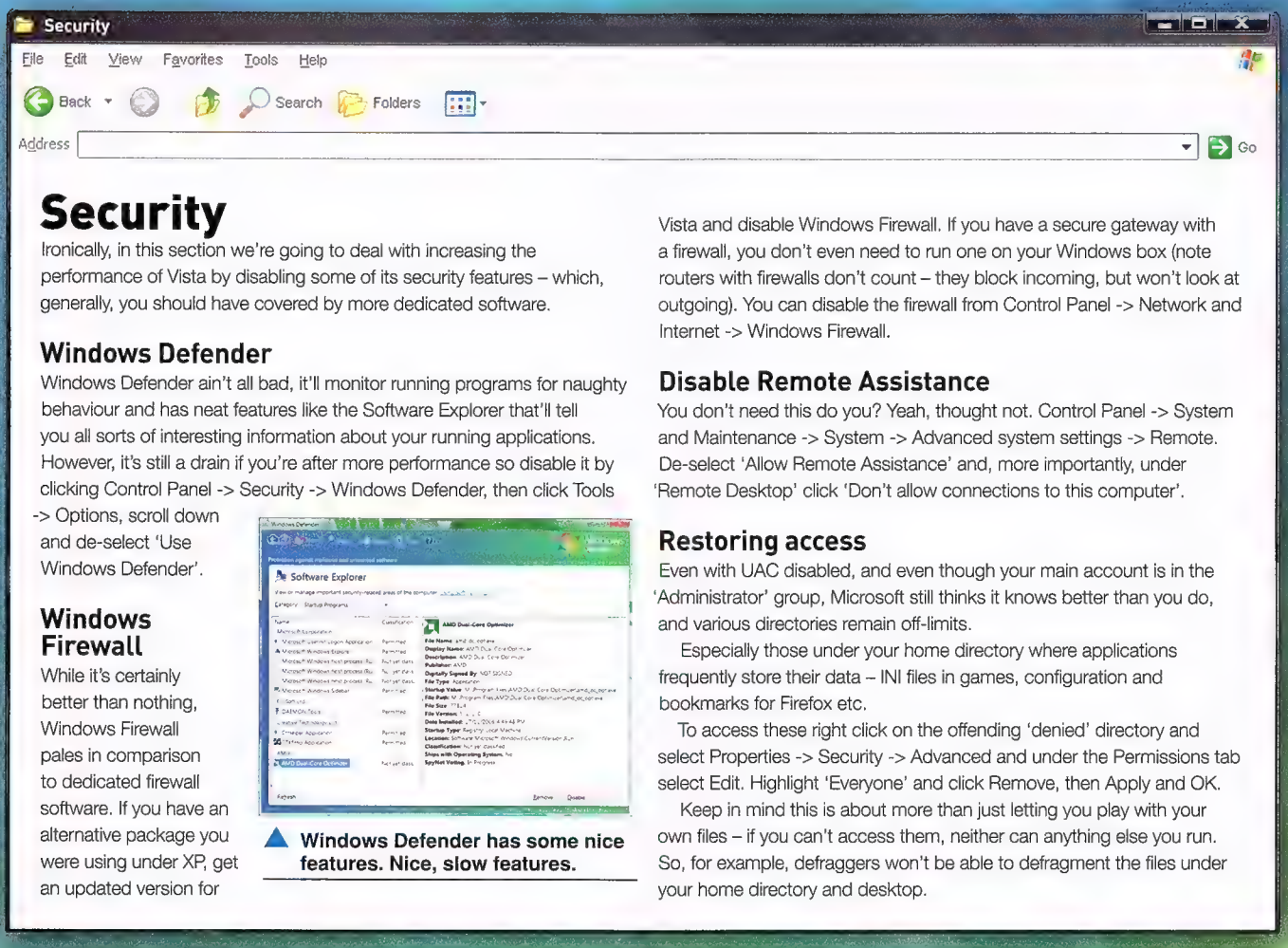
If you want to lose some of the glitz for a more responsive interface, click Control Panel -> System and Maintenance -> System -> Advanced system settings. Then under Performance click Settings and disable the animation, fade and shadow effects to taste. This Atomican leaves them all enabled except for 'Animate windows when minimising and maximising'. Disabling this just gives a snappier, cleaner desktop feel while keeping all the other effects.

Defrag

Finally, using a good defragmenting tool is essential, and the one in Vista sucks even more than in XP. Grab a commercial tool for the job, but wait until you've finished this guide before defragmenting.



A single toggle can do so much.



Security

Ironically, in this section we're going to deal with increasing the performance of Vista by disabling some of its security features – which, generally, you should have covered by more dedicated software.

Windows Defender

Windows Defender ain't all bad, it'll monitor running programs for naughty behaviour and has neat features like the Software Explorer that'll tell you all sorts of interesting information about your running applications. However, it's still a drain if you're after more performance so disable it by clicking Control Panel -> Security -> Windows Defender, then click Tools -> Options, scroll down and de-select 'Use Windows Defender'.

Windows Firewall

While it's certainly better than nothing, Windows Firewall pales in comparison to dedicated firewall software. If you have an alternative package you were using under XP, get an updated version for Vista and disable Windows Firewall. If you have a secure gateway with a firewall, you don't even need to run one on your Windows box (note routers with firewalls don't count – they block incoming, but won't look at outgoing). You can disable the firewall from Control Panel -> Network and Internet -> Windows Firewall.

Windows Defender has some nice features. Nice, slow features.

Disable Remote Assistance

You don't need this do you? Yeah, thought not. Control Panel -> System and Maintenance -> System -> Advanced system settings -> Remote. De-select 'Allow Remote Assistance' and, more importantly, under 'Remote Desktop' click 'Don't allow connections to this computer'.

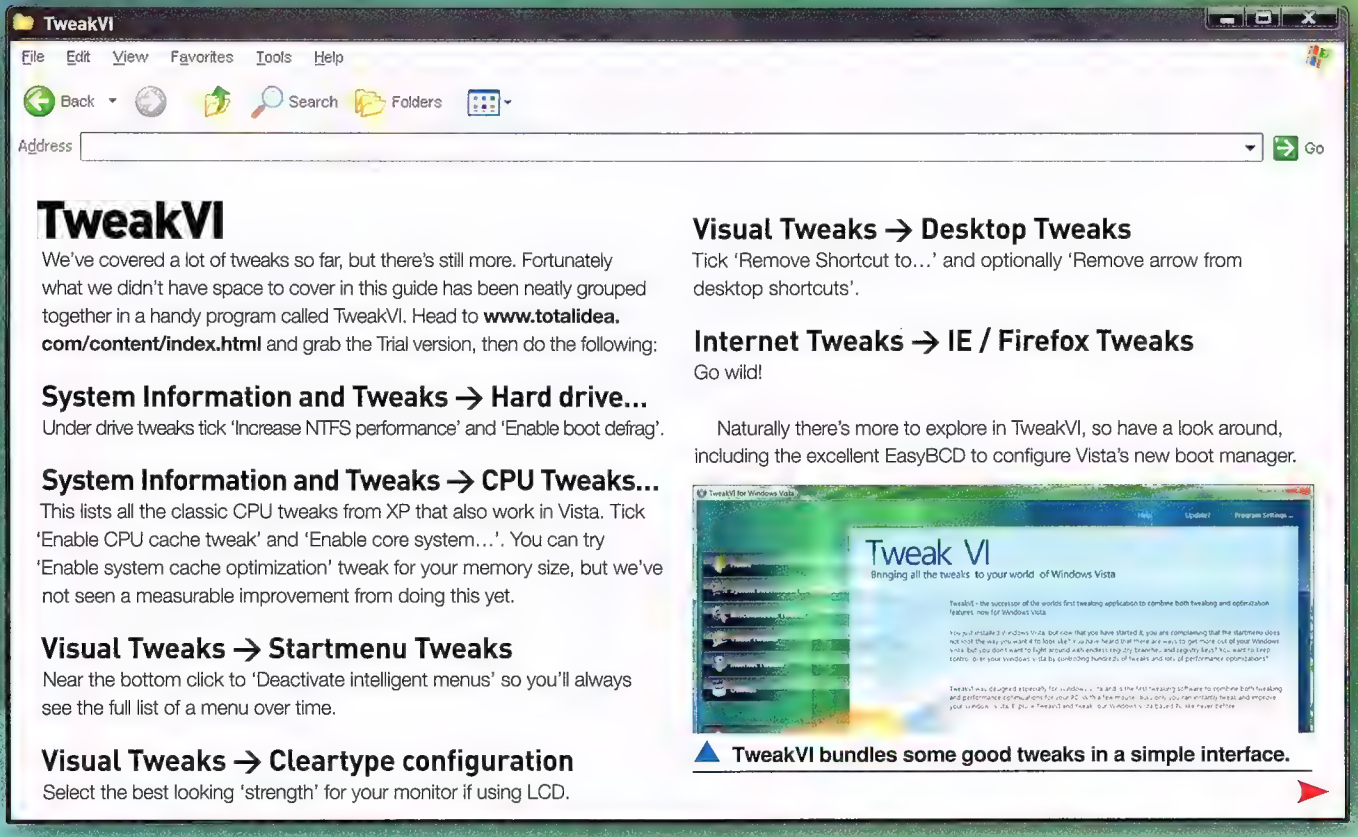
Restoring access

Even with UAC disabled, and even though your main account is in the 'Administrator' group, Microsoft still thinks it knows better than you do, and various directories remain off-limits.

Especially those under your home directory where applications frequently store their data – INI files in games, configuration and bookmarks for Firefox etc.

To access these right click on the offending 'denied' directory and select Properties -> Security -> Advanced and under the Permissions tab select Edit. Highlight 'Everyone' and click Remove, then Apply and OK.

Keep in mind this is about more than just letting you play with your own files – if you can't access them, neither can anything else you run. So, for example, defraggers won't be able to defragment the files under your home directory and desktop.



TweakVI

We've covered a lot of tweaks so far, but there's still more. Fortunately what we didn't have space to cover in this guide has been neatly grouped together in a handy program called TweakVI. Head to **www.totalidea.com/content/index.html** and grab the Trial version, then do the following:

System Information and Tweaks → Hard drive...

Under drive tweaks tick 'Increase NTFS performance' and 'Enable boot defrag'.

System Information and Tweaks → CPU Tweaks...

This lists all the classic CPU tweaks from XP that also work in Vista. Tick 'Enable CPU cache tweak' and 'Enable core system...'. You can try 'Enable system cache optimization' tweak for your memory size, but we've not seen a measurable improvement from doing this yet.

Visual Tweaks → Startmenu Tweaks

Near the bottom click to 'Deactivate intelligent menus' so you'll always see the full list of a menu over time.

Visual Tweaks → Cleartype configuration

Select the best looking 'strength' for your monitor if using LCD.

Visual Tweaks → Desktop Tweaks

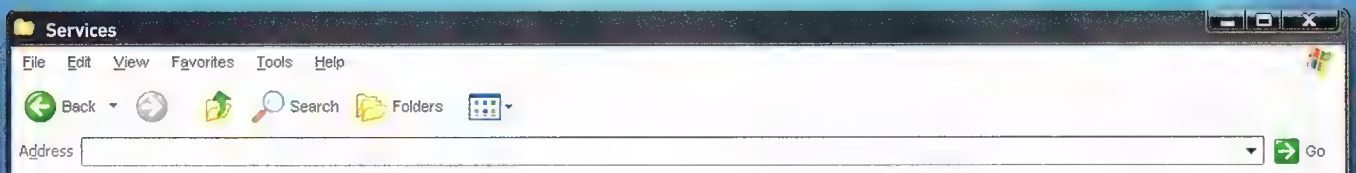
Tick 'Remove Shortcut to...' and optionally 'Remove arrow from desktop shortcuts'.

Internet Tweaks → IE / Firefox Tweaks

Go wild!

Naturally there's more to explore in TweakVI, so have a look around, including the excellent EasyBCD to configure Vista's new boot manager.

TweakVI bundles some good tweaks in a simple interface.



Services

It's the heart of your Vista box – by default there's is an absolute ton of crap running on your new machine through services. No matter how small the resource use, it all adds up, and as a whole the unnecessary services you don't need can suck up memory and CPU time.

As with XP, you can type 'services.msc' into the Run or Start search box to get to the Service manager, but in Vista it's even easier now – just press Ctrl-Alt-Del to bring up the Process manager, click the Services tab, and hit the 'Services…' button.

We don't have room to cover all the services and what they do here, so read carefully the descriptions of the services to disable. Here are our recommendations, depending on your version of Vista, hardware, and installed programs. This list is also based on what isn't already disabled from the various tweaks applied before this section:

- Application Experience
- Background Intelligent Transfer
- Base Filtering Engine
- DFS Replication
- Diagnostic Policy Service
- Distributed Link Tracking Client
- Function Discovery Provider Host
- Function Discovery Resource
- Publication
- IKE and AuthIP IPSec
- IP Helper Service
- IPSec Policy Agent
- KtmRm for Distributed
- Transaction
- Offline Files
- Print spooler
- Peer Networking Identity Manager
- Portable Device Enumerator Service
- Program Compatibility Assistant Service
- ReadyBoost
- Remote Access Connection Manager
- Remote Registry
- Secondary Logon
- Security Center
- Shell Hardware Detection
- SL UI Notification Service
- Software Licensing
- SSDP Discovery
- Tablet PC Input Service
- TCP/IP NetBIOS Helper
- Telephony
- Terminal Services
- WebClient
- Windows Backup
- Windows Error Reporting Service
- Windows Image Acquisition
- Windows Media Player Network
- Sharing Service
- Windows Modules Installer
- Windows Time
- Windows Update (will still load when required)

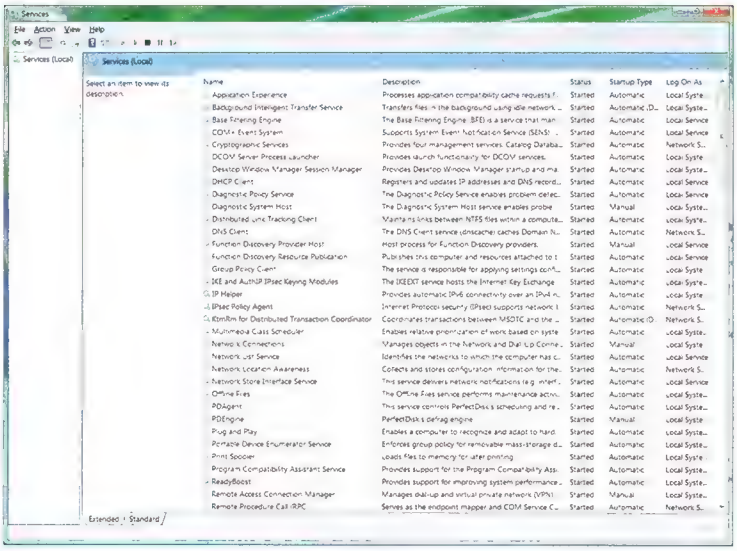
Except for a few stubborn cases, it's always best to set a service to 'Manual' rather than 'Disabled' so it can still be loaded by Vista if it's needed, such as with Windows Update. A stubborn example is 'Windows Media Player Network Sharing Service' which seems to jump up when some games are loaded even when set to 'Manual', so force that sucker to 'Disabled', and the same goes for 'Remote Access Connection Manager' (if you don't use ICS). Finally set services like 'Portable Device Enumerator Service', 'Print Spooler', 'ReadyBoost', and 'Secondary Logon' according to your system.

Faster service shutdown

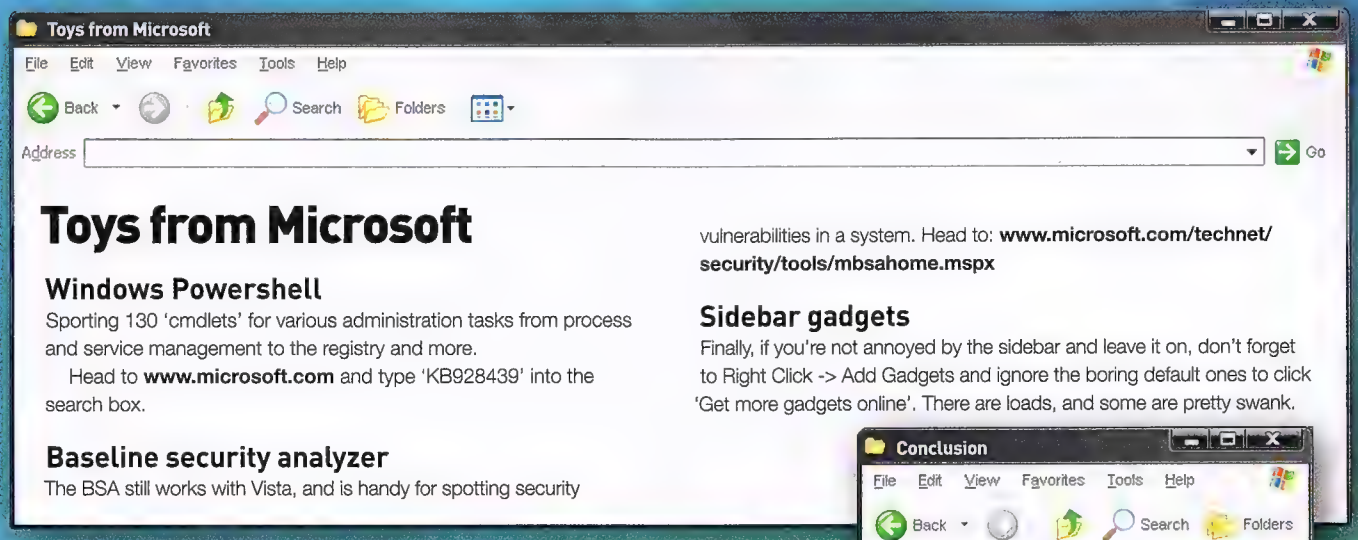
Even with less services running, shutting down can sometimes take a while. Speed it up like so – fire up regedit and browse to:

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control]

Then set 'WaitToKillServiceTimeout' to '2000'.



▲ It's amazing how many of these you don't need.



Toys from Microsoft

Windows Powershell

Sporting 130 'cmdlets' for various administration tasks from process and service management to the registry and more.

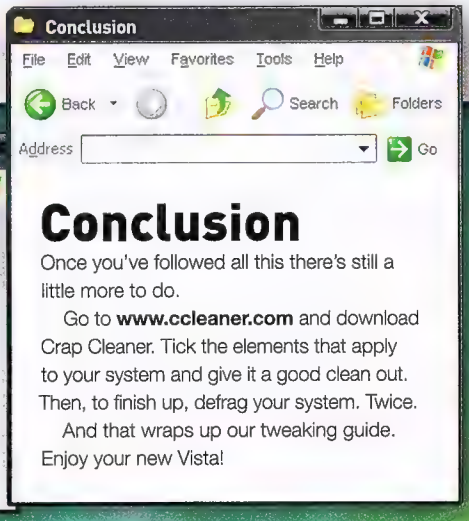
Head to **www.microsoft.com** and type 'KB928439' into the search box.

Baseline security analyzer

The BSA still works with Vista, and is handy for spotting security vulnerabilities in a system. Head to: **www.microsoft.com/technet/security/tools/mbsahome.mspx**

Sidebar gadgets

Finally, if you're not annoyed by the sidebar and leave it on, don't forget to Right Click -> Add Gadgets and ignore the boring default ones to click 'Get more gadgets online'. There are loads, and some are pretty swank.

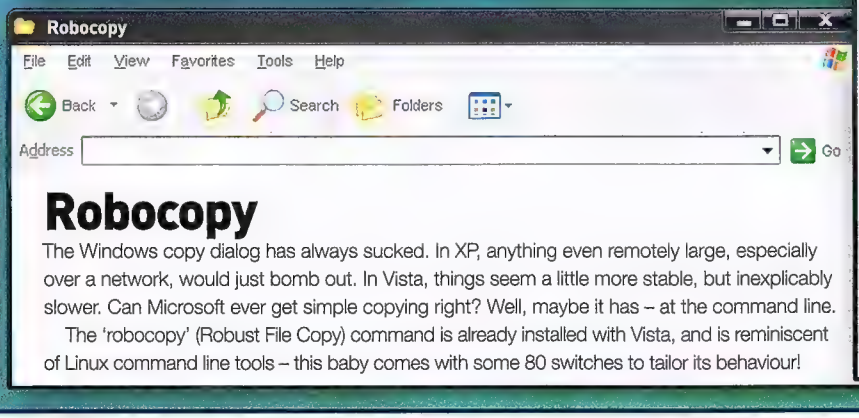


Conclusion

Once you've followed all this there's still a little more to do.

Go to **www.ccleaner.com** and download Crap Cleaner. Tick the elements that apply to your system and give it a good clean out. Then, to finish up, defrag your system. Twice.

And that wraps up our tweaking guide. Enjoy your new Vista!



Robocopy

The Windows copy dialog has always sucked. In XP, anything even remotely large, especially over a network, would just bomb out. In Vista, things seem a little more stable, but inexplicably slower. Can Microsoft ever get simple copying right? Well, maybe it has – at the command line.

The 'robocopy' (Robust File Copy) command is already installed with Vista, and is reminiscent of Linux command line tools – this baby comes with some 80 switches to tailor its behaviour!

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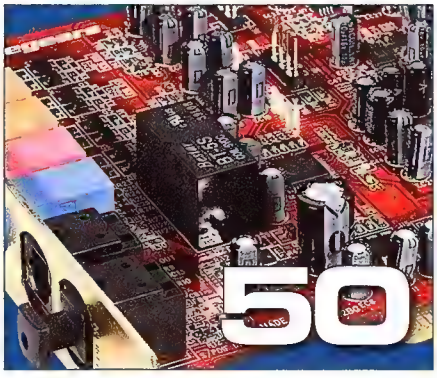
NSW	ARC Computer	02 9748 8322	www.arc.com.au
	Aus PC Market	02 9646 8088	www.auspcmarket.com.au
	Capitol Computer	02 9281 8890	www.capitolcomputer.com.au
	Umart International	02 9745 0877	www.umart.net
SA	Adrenalin Computers & Software	08 8410 0777	www.adrenalin.net.au
	DIY I.T. Supply	08 8340 8090	www.diyit.com.au
	IT4US Computers & Media	08 8231 7588	www.itforus.com.au
QLD	Computer Alliance	07 3421 3200	www.computeralliance.com.a
	Game Dude Computers	07 3387 1500	www.gamedude.com.au
	Dreamworks IT	07 3396 0544	www.dreamworks.com.au
	Umart Online	07 3369 3928	www.umart.com.au
WA	Austin Computers	08 9201 2788	www.austin.net.au/index.asp
	Trinix Computers	08 9350 1600	www.trinix.com.au
	YNOT Computer Systems	08 9330 7666	www.ycs.net.au

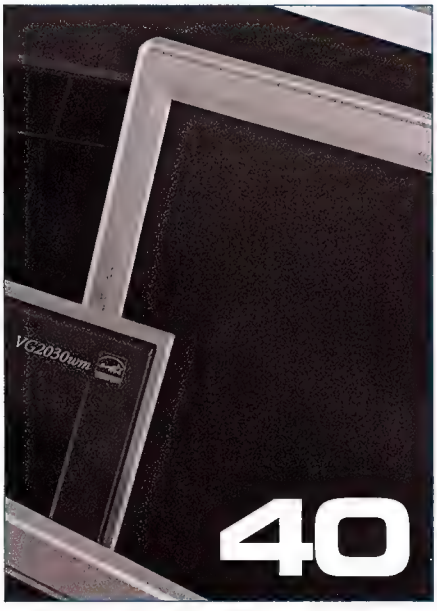
HARDCORE

NEWS, REVIEWS AND ROUNDUPS ON THE LATEST HARDWARE

Kitlog is always fun to maintain. The very nature of listing the best we come across means that sooner or later an incompatibility will crop up, as we no longer have said parts in labs to test ourselves. Sure enough an email arrived this month, kindly pointing out that an 8800GTX does not in fact fit in a Lian Li PC-S80. So back through the annals we poured to pull out a worthy case, the Silverstone Temjin TJ07 eventually winning out.

Apart from kitlog switcharoo, this month we have a swag of monitors for you to feast your eyes on, especially if you're after a cheap widescreen. And of course the usual hardware fun ensues, with wit from Dan 'nuclear power pants' Rutter and the usual Kitlog and Gearbox. Ah, smells good.





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BENCHMARK

How we test, what we test, when we test it

3DMark05 and 06 are the legs of our bench. As freely downloadable tools, they allow people all around the world to compete on a single platform, regardless of its indication of real world application, and its ability to keep our table stable.

On the gaming surface, Call of Duty 2 takes first honours in the FPS department. Quake 4 follows closely behind for our OpenGL benchmarks, taking over from where the venerable Doom 3 left off and offering multiple CPU optimisations. Half-Life 2 remains, its market penetration simply too huge to ignore. X3: Reunion makes an appearance, in an effort to have a benchmark that is not an FPS. In the same line, Splinter Cell: Chaos Theory has also been added. Other games do exist. Honest.

All tests are run at 1280x1024, 1600x1200 and 1920x1200 with vsync off, to cater for the most popular LCD resolution, CRT resolution and those who own widescreen monsters respectively.

To hit the CPU, we use LAME MT, a multithreaded version of the popular MP3 encoder, which is used to compress a standard 30-minute WAV file. Similarly, VirtualDubMod is used to compress a standard 1GB raw video file into XviD at 1300Kb/s. Other CPU specific tests in our stable are Maxon's CineBench and SuperPi Mod. Rounding out the suite, SiSoftware's Sandra tests several subsystems across the board, while HDTach and ATTO Disk Benchmark helpfully provide hard drive scores.

All these tests are run on a Windows XP SP2 platform, running the latest official drivers available. Every test is run three times to eliminate any oddities that may crop up along the way, the final result printed in the magazine being an average of those scores.

Of course, all this is pointless without a standard set of hardware, and as such it is laid out below for the world to see. On with the testing!

The *Atomic* Hot Award is given only to the best. In our roundups, we differentiate the best further using the following awards:

VALUE AWARD This means the product is the best buy price-wise.

PERFORMANCE AWARD Price isn't a big factor – it just has to make our benchmarks burn and our eyes water.

EXTREME AWARD Forget everything. If it's *mind-blowingly amazing*, then it'll get an Extreme Award.

BENCHMARKS

Graphics

3DMark05
Game tests only, 4xAA, 8xAF
www.futuremark.com

3DMark06
Game tests only, 4xAA, 8xAF (SM2.0), 8xAF (HDR/SM3.0)
www.futuremark.com

Half-Life 2
Canals custom timedemo, 4xAA, 8xAF, all details highest, HDR off
www.half-life2.com

Splinter Cell: Chaos Theory
Lighthouse Demo, Shader Model 3.0, 8xAF, shadow resolution high, all features on
www.splintercell3.com

X3 Rolling Demo
High settings, auto quality control disabled, glow enabled, 4xAA, 8xAF
www.egosoft.com/games/x3/info_en.php

Call of Duty 2
Hill 40 – Defend custom timedemo, 4xAA, 8xAF, all options highest
www.callofduty2.com

Quake 4
High quality, 4xAA, 8xAF, Multiple CPU support, all options highest
www.quake4game.com

Subsystems

HDTach
www.simplisoftware.com

LAME MT
softlab.technion.ac.il/project/LAME/html/lame.html

VirtualDubMod
virtualdubmod.sf.net

SuperPi Mod
www.xtremesystems.com/pi

Cinebench
www.cinebench.com

SiSoft Sandra
www.sisoftware.co.uk

Everest
www.lavalys.com

Others

DisplayMate
www.displaymate.com

ATI Tool **www.techpowerup.com/atitool**

RivaTuner
www.guru3d.com/rivatuner

FRAPS
www.fraps.com

CPU-Z **www.cpuid.com**

Stress Prime 2004 Orthos
sp2004.fre3.com

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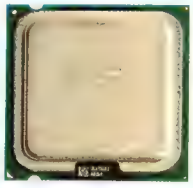
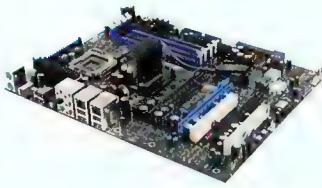
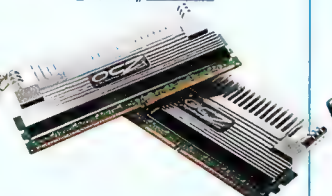


▲ Intel Core 2 Duo X6800

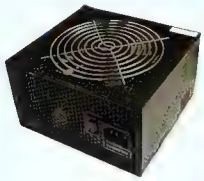


▲ EVGA 680i SLI



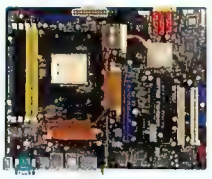
▲ 2GB OCZ Flex XLC PC2-9200

▲ Western Digital 1500ADFD



▲ SeasonicS12 600W

▲ AMD Athlon 64 FX-62

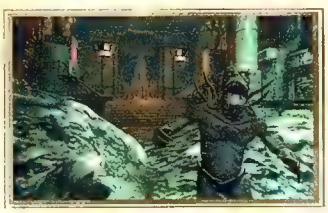


▲ ASUS M2N32-SLI Deluxe

▲ 2GB OCZ Flex XLC PC2-9200

▲ Dell 2405FPW

▲ ASUS 8800GTX



The RPG for the Next Generation MARCH 2007

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VG2030wm
ENERGY STAR
CMV 946D

BUDGET GAMING LCDs

Craig Simms screens some splendid, sexy screens. And invents new tongue twisters.

We can't all own 30" screens, be they Dell, Apple, Samsung or HP. In fact for most, monitors that are 24" and above are out of reach financially. The bigger screens even need a fairly up-to-date video card with a dual link DVI port to run, forcing the total cost of ownership higher again. So, as much as we might like to own our own vast portal into another dimension of gaming immersion, sometimes we have to make do with smaller.

Which is what makes the new midrange battleground so interesting. Although only a fraction smaller in size, competitors have fiercely cut the prices on these monitors to a minute size to make them actually attainable to the public at large. In some circumstances this means corners are cut, especially in build quality and we end up with something that feels a little cheap. Yet for the price, it is still massively *accessible*. What we didn't expect was just how good the quality was on these bounteous beauties.

The requirements were simple – keep the cost under $1000, and the size above 19". Imagine our surprise when we only received one 19",

Fig 1. Our 1080p movie sample shows a high-motion scene of an alligator taking down a buffalo into water. The huge amount of splashes need a low response time to remain clear, while the 1080p detail allows us to check how vibrant and discreet the monitor is with its colour ranges.

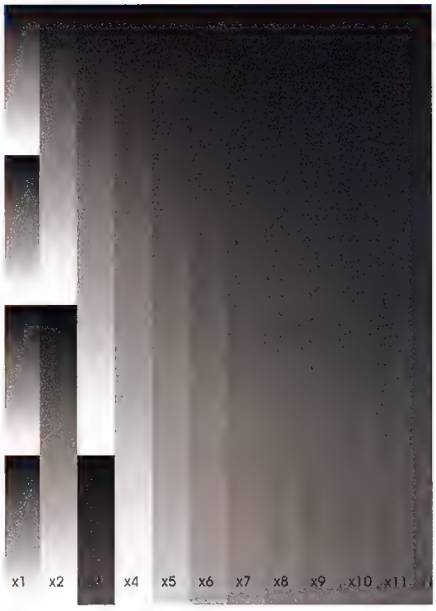


Fig 2. Since the original 2407WFP issues, we've run vertical gradient tests as well to make sure every angle is covered.

"WHAT WE DIDN'T EXPECT WAS HOW GOOD THE QUALITY WAS ON THESE BEAUTIES."

and a whole bunch of 22" screens, all of them not just under $1000, but under $800, and with all indications that things will get cheaper again.

And so with GeForce 8800GTX in one hand – ow, hot! – DVI cable in the other and the lights dimmed, we jump into marvellous monitor match-up madness once more, to extract a victor. Or a Victoria, if you're that way inclined.

HOW WE TESTED

DisplayMate is our weapon of choice, in particular the greyscale tests (*Fig 4*) that display 255 shades from black (0) to white (255). Very few monitors can successfully display this entire range, usually going too dark and too light too quickly. This results in a high contrast screen in which a lot of detail can be lost.

We also focus on the greyscale and colour gradient ramps (*Fig 3*), checking for banding within certain colours, and to make sure once again that things don't get too light or dark too quickly. While slight consistent banding is usually acceptable, the smoother the gradient the better. Non-uniform banding is never welcome. We also check to make sure the greyscale ramps don't discolour, usually either turning green or purple. These gradients also have a tendency to smear and streak if a monitor features broken auto-colour correction or manipulation. The final gradient test is a set of vertical gradients (*Fig 2*), which we now test

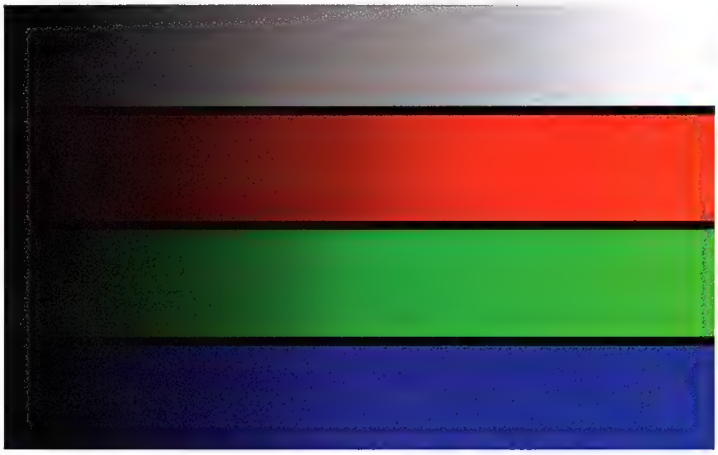


Fig 3. The colour gradients, or 'ramps' show us how subtley the monitor can differentiate 255 shades of colours. Typically monitors tend to get too dark too quickly – the left hand side. Lesser screens will not have a smooth gradient and begin banding visibly, sometimes unevenly and green/purple discolouration and streaking can appear in the greyscale gradient.

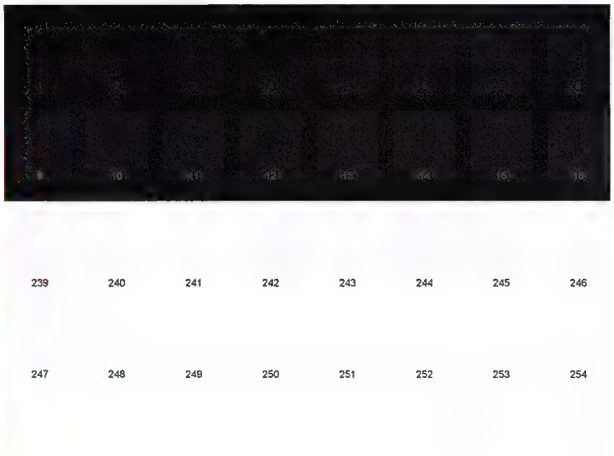


Fig 4. The greyscale test allows us to see the range of darks and lights that the monitor is capable of, from 0 (pure black) to 255 (pure white). The more shades that are discernible from the background, the better the monitor is and the more detailed and accurate the images will be on the screen.

▲ **Fig 5. Someone's lost his head over image quality. The first level in Quake 4 has served as our monitor response time gaming test for a while, the fast action demanding of even the finest monitors.**

consistently after the Dell 2407WFP REVA02 turned up problems specifically to do with vertical gradients due to defective Faroudja image processing.

To test motion we play a sample 1080p MPEG2 transport stream movie (*Fig 1*) to make sure no annoying auto-colour system screws with the image, and to tax the response time of the screen with a fast motion scene. Depth of colour is also watched here.

Finally, we boot up the old classic Quake 4 (*Fig 5*), set it to the native resolution of the screen, turn on VSync and start a new game to check the response time for gaming, fragging a few Stroggs in the process. Is it just us, or does that sound like a deeply suspect euphemism?

Of course there is a subjective element, especially since everyone's eyes are different. Nonetheless we'll do our best to rank the monitors as we see it (*Oh, for the love of puns, someone shoot him, please – Ed*).

Chimei CMV 946D

Price **$390** Street Price **$300** Supplier **www.protac.com.au**
Specs **650:1 contrast ratio; 2ms G2G; 1440 x 900; swivel; tilt; DVI and VGA.**

Chimei's 19" widescreen suffers from a slightly below average viewing angle, discolouring once you move too far to the left and right. Fortunately, unlike the 22", you can take in the whole screen without having to move your head, which means that this situation will rarely arise.

It performed ordinarily in DisplayMate, giving a four at its darkest in the greyscale tests, and a 248 at the bright end of the scale. This was reflected in the colour gradients, where things got far too bright too quickly. Pronounced banding was also visible in the gradients, especially at the darker end of the scale where things got decidedly non-uniform.

Gaming is acceptable and movies were perfectly fine. In spite of its flaws, at the insanely cheap price above the Chimei CMV 946D screen really can't be ignored for budget-focused consumers.

SCORE **8.0** OUT OF 10

Samsung 226BW

Price **$799** Street Price **$570** Supplier **www.samsung.com.au**
Specs **1000:1 normal contrast; 3000:1 adaptive contrast; 2ms G2G; 1680 x 1050; swivel; tilt; DVI and VGA.**

Samsung's offerings are usually high quality – unfortunately this one seems to have missed the mark a little.

The chassis is constructed well, the buttons relatively easy to understand and navigate, but this isn't the issue.

While it displays a decent one to 251 range in the greyscale tests and the colour ramps show the best gradation we've seen (the dark end not going dark until it's meant to – an obscenely rare thing), viewing angles are close to abominable and there's a noticeable light bleed at the top and bottom.

Bizarrely, dark tones below 4 in DisplayMate flickered, as if the crystals in the screen didn't know what to do. This was replicated through the game and movie tests as well, however to be honest if you sat more than 50cm back, you'd never notice it.

Still, a fault is a fault, and at this price you'd do better to look elsewhere.

SCORE **7.0** OUT OF 10

ASUS MW221U

Price **$750** Street Price **$570** Supplier **www.asus.com.tw**
Specs **800:1 contrast; 2ms G2G; 1680x1050; swivel; tilt; DVI and VGA.**

The ASUS starts with an overly blue tinge that can only be resolved through setting a custom colour. As usual the preset 'Splendid' colour system is anything but – you'll get significantly better results tuning yourself. Oddly, the 'Splendid' button also serves as the cancel button in the menu.

Buttons across the front of the bezel are interesting, but proved highly difficult to push at times – style is fine, but when it doesn't work it might be time to return to square one.

The monitor suffered a little from inconsistent banding in the gradient, particularly near the dark end but was otherwise good, very impressively hitting all 255 colours in the greyscale test, and the viewing angles are among the best in the roundup. There was unfortunately light bleed from all sides of the panel, most notably from the top which was a bit too noticeable. The built-in speakers are in a word, awful.

ASUS has definitely improved its image quality, but it needs to focus a bit more on the rest of the monitor as well.

SCORE **8.0** OUT OF 10

Chimei CMV 221D

Price **$549** Street Price **$499** Supplier **www.protac.com.au**
Specs **700:1 contrast; 5ms G2G, 1680 x 1050, tilt, swivel, DVI, VGA.**

The 22" screen that changed the market. Still impressively cheap, and so long as you sit directly in front of it the image quality is pretty good. Viewing angles are quite narrow though, so even a slight shift in where you're sitting will cause discolouration of the screen.

DisplayMate tests were acceptable, showing from three to 251 in the greyscale, and like most monitors it got dark too quickly in the gradients. There was a small amount of light bleed from the top and bottom.

Movies were fine, yet in gaming blurring was definitely more noticeable than the 2ms models, something that usually isn't obvious.

Construction-wise the Chimei is certainly the cheapest of the lot, but this is reflected in the discount price so you get what you pay for. Buttons on the side of the monitor are annoying.

Still, for those on a budget, this 22" represents great value.

SCORE **7.0** OUT OF 10

ViewSonic VG2030wm

Price **$460** Street Price **$399** Supplier **www.altech.com.au**
Specs **800:1 contrast; 5ms G2G; 1680 x 1050; tilt; swivel; DVI and VGA; 3.5mm audio.**

ViewSonic's 20" definitely delivers the best gaming experience of the lot, providing the sharpest images at high movement.

At 20" though it does seem a lot smaller than the 22" screens, most likely because it is buried, postage stamp-style, in its chassis. The speakers don't help the cause either – although they're better in clarity than ASUS's, they handle even less volume, eventually dying in crackles and distortion.

The buttons on the side – apart from their very existence on the side being a horrible trait – are ridiculously tiny and difficult to use for navigation. There's plenty of space on the front, guys – ditch the speakers and up the usability.

The visual range was good, showing from four to 255 in the DisplayMate greyscale tests, and colour ramps were excellent.

A good monitor overall that you won't be disappointed with.

SCORE **8.0** OUT OF 10

Acer AL2216W

Price **$580** Street Price **$470** Supplier **www.acer.com.au**
Specs **700:1 contrast; 5ms G2G; 1680 x 1050; tilt; swivel; DVI and VGA.**

Hang on – this street price is cheaper than the Chimei. And it has considerably better viewing angles and build quality. The menu is even easier to use, with clearly marked buttons.

Is someone actually exercising common sense here? Surely not in this industry.

OK, the design is a bit on the bland side, the build is a tiny bit fragile and you have to set custom colours to get a good brightness out of it (R55/G55/B55 works well), but on the positive side it does manage a four to 252 range in the DisplayMate greyscale tests, and the gradients are sexy. Gaming and movies are excellent providing a complete and rounded package.

A solid, unspectacular monitor that does the job that it's meant to do, without getting distracted by all the bells and whistles.

SCORE 9.0 OUT OF 10

ASUS MW201U

Price **$650** Street Price **$490** Supplier **www.asus.com.tw**
Specs **700:1 contrast; 2ms G2G; 1680 x 1050; swivel; tilt; DVI and VGA; 3.5mm audio.**

Wow. This is an exact miniature of its 22" cousin on the previous page, image quality and all in spite of the lower contrast ratio. So if you're after specs, check the previous review. Of course there are differences, such as being a whole two inches smaller, but the screen still looks good and the speaker still sucks.

The buttons were easier to push on this model, suggesting that they will get worse with wear and ASUS needs to go back to the design drawing board on this one.

When colour balancing you'll notice that the OSD stays on for a *very* long time, requiring you to hit the exit button (or 'Splendid' button... we suppose exiting is splendid) to make it disappear expediently.

Viewing angles and gaming with its larger cousin are excellent.

So long as you have your own set of speakers or headphones, then this monitor isn't a bad choice at all.

SCORE 8.0 OUT OF 10

Dell E228WFP

Price **$599** Street Price **$599** Supplier **www.dell.com.au**
Specs **800:1 contrast; 5ms G2G; 1680 x 1050; swivel; tilt; DVI and VGA.**

The E228 is Dell's budget 22" monitor, yet the excellent build quality says otherwise.

DisplayMate tests were a little bit of a mixed bag – while the colour gradients were excellent, managing to rival the Samsung's offering in terms of a fantastic representation at the dark end of the scale, all gradients were noticeably more banded than competing models. This isn't too much of a problem as the banding is uniform, meaning it's less likely to cause problems in the real world – but it may still cause issues for professional users and perfectionists.

In the greyscale tests it managed three at the dark end of the scale, and 254 at the light, and admirable representation. Motion and gaming were more than acceptable.

While this is definitely the best built monitor of the lot, for display quality and price there are some better options in the market, such as Acer or ASUS's 22" offerings.

SCORE 7.5 OUT OF 10

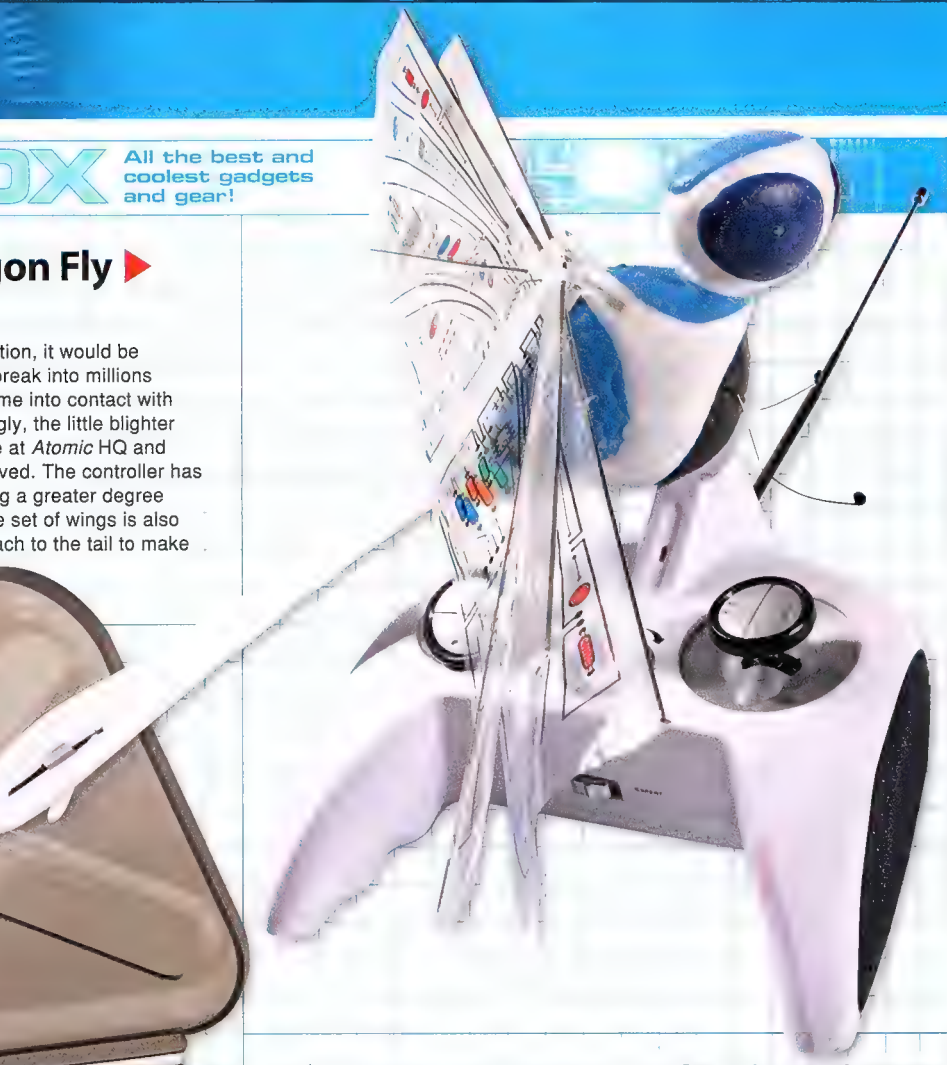
GEARBOX

All the best and coolest gadgets and gear!

Wowee Flytech Dragon Fly

Price $70 **Supplier** Wowee
Website www.flytechonline.com

Given the somewhat lightweight construction, it would be logical to assume the Dragon Fly would break into millions of tiny Styrofoam pieces the second it came into contact with anything of reasonable solidity. Surprisingly, the little blighter has survived weeks of heavy testing here at *Atomic* HQ and flies just as competently as the day it arrived. The controller has two modes, Beginner and Expert, allowing a greater degree of manoeuvrability if you so wish. A spare set of wings is also included, as well as a ribbon you can attach to the tail to make it a bit easier to steer.



Lamptron Noise Reduction Kit

Price $22 **Supplier** PC Case Gear
Website www.pccasegear.com.au

Inside this little black box you'll find an assortment of rubber screw replacements for the HDDs and fans of your case; rubber feet for the case itself and a pair of cables to supply less power to those aforementioned fans – a 12V-to-9V and 12V-to-7V are supplied. Otherwise there's not much to this compact package, other than serving as a nifty place to keep all your spare (and now useless) metal screws. How much a reduction in noise you'll get depends on how many fans and drives you're running. That said, don't expect miracles.

SteelKeys 6G

Price $149 **Supplier** Pro Gamer
Website www.progamer.com.au

The 6G looks, and to some degree sounds, like a standard 104-key keyboard. The keys are extremely springy and make a noticeable crack when you hit them. And crack they will, requiring a definitive push down to register. Depending on your typing style, you may have to hit relatively hard to get the board to accept your commands. Included with the board is a set of grey replacement keys you can use to colour-code control keys. The usefulness of such a feature is debatable and given the price, probably not enough to sway even the most avid gamer.

SteelSound 3H

Price $99
Supplier Pro Gamer
Website www.progamer.com.au

Hardcore these headphones are not. Given the choice, you're probably not going to listen to Beethoven's best through these tiny drivers. They do produce a decent sound considering their size, and the fact it folds into itself. There's even a retractable microphone making it more portable. Definitely a plus for the LAN gamer, but if you're even remotely stationary for long periods of time, it might be best to look for a higher-end set for your gaming, and music listening, needs.

Thermalright HR-03

Price $59.90
Supplier PC Case Gear
Website www.pccasegear.com.au

You get your choice of a passively or actively-cooled video card depending on how you mount this sucker. Upside down, the heatsink should draw heat away from the GPU and closer to your CPU and case fans. Right-way up, as per a normal GPU heatsink, and you should have space to whack a fan onto it. The HR-03 however is not exactly clearance-friendly, so be sure to check if it'll fit into your current rig before making your purchase.

Razer Mantis Control

Price $55 **Supplier** Altech **Website** www.altech.com.au

The Razer Mantis Control markets itself as a 'precision mousing surface', which does little to explain why it smells like a bundle of fresh tennis balls – god-awful – and looks like it was cut out of a disused wetsuit.

It's supposedly optimised for use with RTS, MMO and design applications, but not first person shooters, so those guys will have to look elsewhere. After searching for a good half metre square spot of desk space, we gave the pad a go, only to be disappointed. While it serves the purpose of a mousepad well, the fibrous surface may chafe more sensitive users. You've been warned.

SecureStix 1GB

Price $149 **Supplier** Securestix
Website www.securestix.com.au

IBM isn't the only company that can whack fingerprint scanners on its hardware. SecureStix has figured out how to jam one on a USB key to provide users with a bit of security in the portable storage department. The finger registration process is mostly painless, and allows you to register more than one digit in case you somehow, uh, lose one. The drive's software will then create a file on the stick that acts as a 'private' disk. Files stored here can only be accessed after the software verifies a finger-swipe on the stick's inbuilt scanner. Safely removing the USB key was fiddly though, and sometimes only possible after killing the BioPrint monitoring process in Task Manager. Also, while it might be impossible for someone to access your private drive, there's nothing stopping them from deleting it through the readily accessible public drive.

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Dell 2707WFP

Craig Simms always wanted an extra three inches.

SPECIFICATIONS

Price **$1999*** Street Price **$1999**
Supplier **Dell**
Website **www.dell.com.au**
Specifications **450cd/m² brightness; 1000:1 contrast ratio; D-Sub, DVI, composite, component, S-Video; 9-in-2 media slot; 4x USB ports; 178° V/H viewing angle; 6ms G2G.**

For most, the 30", 2560 x 1600 monoliths that have been entering the market lately are a bit much, especially for gaming. Ignoring the startup cost, at that resolution you really need a pair of 8800GTXs and a superclocked Core 2 Duo to do games justice.

The 2707 is set to fix this, inserting itself neatly in a niche at a mostly monstrous 27". Despite the size, it manages to keep the 1920 x 1200 resolution of the 24" models, resulting in everything, well, appearing a bit bigger. We can hear the myopes cheering already.

The bigger advantage though is for the home theatre/convergence groups – and bigger high resolution movies are usually always a bonus.

It's also inherited the mass of inputs from the 24", with VGA, DVI, component, composite and S-Video – the 30" only supports DVI. This makes it the ideal platform for high-def gaming as well.

We know, the 2407 in its infinite revisions had its fair share of problems with component and the Xbox 360 – so we hooked said white console up through said input in 1080i and 1080p to see what was cracking.

1080p said no right from the beginning, the monitor claiming it was out of range. 1080i looks fantastic though, with the usual flickering filtered nicely out. The image does look a little stretched, but setting the screen ratio to 1:1 fixes this and the black border created by this is still acceptable.

On the PC side, the 2707 is simply delectable – dominating the DisplayMate tests both in the visible greyscale spectrum (all shades from 1 through 255 were definable) and colour ramps. Video looks great, and gaming is just as grand at 6ms G2G, Quake 4 being nicely sharp and fast.

About the only complaint we have is that the default PC colour profile is complete arse, and we had to switch to 'Mac' to get a decent temperature. A little bit confusing considering we're running a PC.

The stand and particularly the base look a little cheap, but fortunately are sturdy enough and provide height, tilt and swivel adjustments. We're not sure whether we like the brushed aluminium frame around the outside, but no doubt it will appeal to some. In fact, the more we see it the more we get used to it.

About the only thing left on the wishlist is the same thing that's been there since the 2405 – a VGA/DVI PIP (or even two DVI inputs) so we can administer two systems at once on the one screen. Then again we'd also like a built in KVM, a drink holder, three death lasers and for it to turn into a miniature version of Soundwave when the screen goes to sleep, so we figure most will be happy with what's there.

The 2707WFP is, in a word, awesome. If you know you can't afford the graphical power to feed a 30" but still want sheer size, then this big bugger is for you.

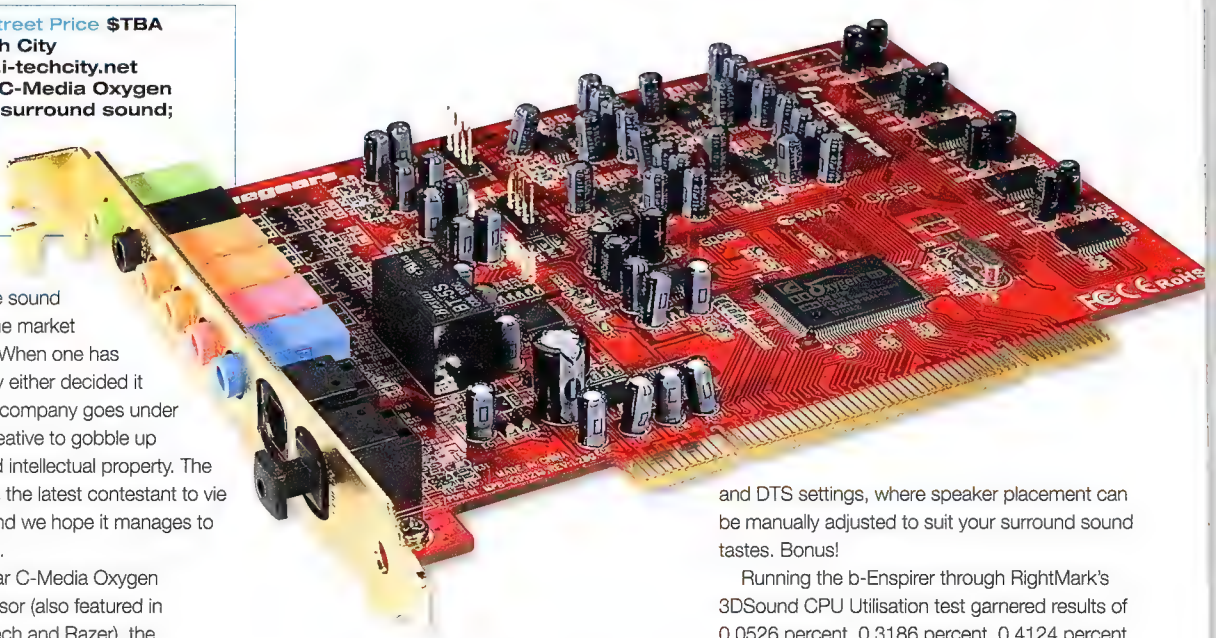
SCORE **9.0** OUT OF 10

Bluegears b-Enspirer

Damien Virulhapan is inspired to find an opponent to the Creative juggernaut.

SPECIFICATION

Price **$199** Street Price **$TBA**
Supplier **i-Tech City**
Website **www.i-techcity.net**
Specifications **C-Media Oxygen CMI8788; 7.1 surround sound; 24bit/192kHz.**



Creative's dominance in the sound card industry has left the market barren of competitors. When one has appeared, it has usually either decided it was a bad idea, or the company goes under very quickly, leaving Creative to gobble up both their products and intellectual property. The Bluegears b-Enspirer is the latest contestant to vie for Creative's throne, and we hope it manages to stick around for a while.

Based on the popular C-Media Oxygen CMI8788 audio processor (also featured in hardware from Auzentech and Razer), the b-Enspirer supports a luscious 24bit/192kHz playback which should suit anyone's needs.

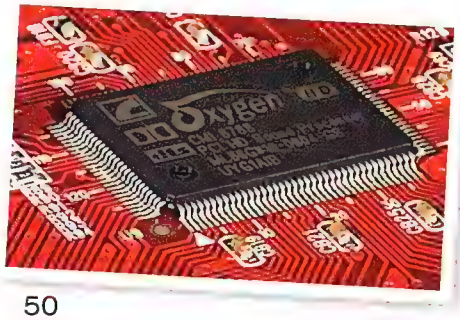
The usual outputs are there for up to eight-channel sound, meaning headphone/front, side, centre/subwoofer, back, and S/PDIF are there for the plugging in. Inputs are also fairly standard, with mic-in, line-in and S/PDIF available. Those lucky buggers with 7.1 speaker setups can fully immerse themselves in audio bliss with the b-Enspirer installed in their system.

> **The b-Enspirer has all the Dolby and DTS format support needed in a consumer level sound card.**

The b-Enspirer has all the Dolby and DTS format support one would need in a consumer level sound card, including Dolby Pro-Logic IIx and DTS Interactive, which cannot be found on the competing X-Fi XtremeMusic.

Despite the range of Dolby and DTS options, the b-Enspirer lacks support for EAX 3.0 and above. This is painful news for gamers looking for a competent Creative alternative, and the situation doesn't look like it will improve – although EAX 2.0 is free, future revisions may require an unattractive licence fee. Oddly Bluegears is happy to pay the licence for Dolby, which either means the fee must be exorbitant indeed or it simply didn't see EAX as necessary.

The main difference is that EAX 2.0 only supports a maximum of 32 voices compared with EAX 5.0, which can handle up to 128 voices. Obviously you'd need to find a game that uses EAX 5.0 for this to be of any benefit, and fortunately there aren't too many out there at the moment.



The bundled drivers and software are a lot more respectful of your hard disk space than Creative's alternative, coming in at a nifty 23MB post-installation compared with the 364MB of torment that the dominant sound company unleashes on your unwitting hard drive.

For those on Vista, Bluegears has been prepared for a while, offering beta drivers on its website. It will only be a matter of time before official drivers become available.

Once installed, the b-Enspirer control panel is cleanly laid out with tabs separating the sound card settings and effects. Of note are the Dolby and DTS settings, where speaker placement can be manually adjusted to suit your surround sound tastes. Bonus!

Running the b-Enspirer through RightMark's 3DSound CPU Utilisation test garnered results of 0.0526 percent, 0.3186 percent, 0.4124 percent and 0.4488 percent (standard deviation) CPU utilisation using DirectSound 2D, DirectSound 3D hardware and DirectSound 3D hardware + EAX respectively when tested using 127 buffers. The X-Fi XtremeMusic's results were 0.4516 percent, 0.5049 percent, 1.9526 percent and 2.2705 percent (standard deviation), meaning the b-Enspirer uses less CPU cycles to get the job done. This is valuable when gaming, as a lesser load on the CPU can mean higher FPS.

Putting our ears up to the speakers, the b-Enspirer brought excellent clarity and quality when listening to audio CDs. This is without the need for Dolby or DTS settings, which is good news for the audiophiles who like their sound un-bastardised, while at the same time pleasing those that want a special sound to their audio.

Despite the b-Enspirer's lack of full EAX support playing Doom 3 was again very good, with the same clarity and quality found when playing back music. The surround sound was able pick up all the audio nuances, offering a smooth pan between channels.

The b-Enspirer is definitely an excellent alternative to Creative, offering features not found on its range of cards and delivering the sound quality to back it up. If you value every single CPU cycle, are after good quality sound and want to avoid the now-famous Creative crackle, snap this one up now. We can only hope the company manages to beat the curse, and stick around for a bit.

SCORE **8.5** OUT OF 10

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Gigabyte 3D Aurora 570

Dan Chiappini limbers up for some fun with a flexible case.

SPECIFICATIONS

Price **$259** Street Price **$230**
Supplier **Gigabyte**
Website **www.gigabyte.com.tw**
Specifications **ATX; front IO panel; lockable; side-mounted SATA drive bays; tool-less steel construction; pre-drilled grommet outlets for water kit tubing.**

Let's face it, even within the enthusiast community there's still some hesitation about putting thousands of dollars of your faith in liquid-cooling systems. Despite a proven track record, the risk of your PC full of precious technical gadgetry being flooded by a dodgy seal or a split pipe is enough to turn people off. Enter the Gigabyte 3D Aurora 570, the perfect case for dabblers and geeks strong of will, but who fear the move away from air-cooling.

Sizing up at 205 x 522 x 570mm and 8kg it's a bit larger than your average midi ATX case, but uses the space to cram in five 5.25" drive bays, room for a pair of 3.5" drives and five hard disks with the included toolbox removed – or two if you leave it in. It's about 10 percent larger than the last Aurora model, with the internal dimensions giving you plenty of room to get creative with cabling, and the snap panel helps secure strays without needing to get freaky with a packet of zip ties.

The body is aluminium, but is offset by the heavy steel lockable door. It's a welcome change from the flimsy plastic doors, secured by pins that break during transport and everyday optical drive use.

Gigabyte has taken a firm stance on putting quality first, and in doing so you'd be hard-pressed to find a rough surface inside the chassis, keeping the blood sport to a minimum. Tool-less design is also the order of the day, with slide rails for all your drives and a single-hinged metal strip securing cards by the backplane. This case has been specifically designed to work best with the new revision of the 3D Galaxy II kit, and even includes mounting holes on the bottom of the case for the reservoir. The back panel has two pre-drilled outlets with grommets for passing your water-cooling tubing through.

> **"It's the perfect case for those who crave component legroom..."**

The extra space inside goes a long way for tube weaving if you opt for the liquid route; if it's not your thing, it's still a great case for an air-cooled machine, giving you the option to upgrade to a water kit down the track. The sheer size also means there's plenty of space past the edge of the motherboard's PCB to install those pesky longer length graphics cards like the GeForce 8800GTX.

Three 120mm fans adorn the case. One is mounted behind an intake on the front and helps cool the drive bay, while two exhaust fans on the rear also line up with the radiator of the Galaxy kit to further cool water as it runs through the loop. All three fans have the obligatory blue LEDs for that bling look. No PSU is included.

In the box you'll find two side window options. Default is a chain mail style panel for ventilation, but you can easily pop and swap it using a screwdriver for the clear Perspex look, and to show off your box's guts.

It also includes a front projection LED system to display your own logo, or if you're a total fanboy, Gigabyte's. It's not going to put Lian Li, Antec or Cooler Master out of business, but it's a nifty little extra that'll add a quarter-inch to your e-peen when you're showing it off to mates.

The 3D Aurora 570 does a great job either as an air-cooled system in an oversized case or as the perfect companion to Gigabyte's 3D Galaxy II water-cooling kit for those who dare to take the plunge. The size and bulk make it a bit big for regular LAN goers, and you may need to clear some desk space due to its size, but it is the perfect case for those who crave component legroom, with the option to grow alongside the user. Best of all it costs about the same as your average basic enclosure.

SCORE 8.5 OUT OF 10

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XFX Geforce 8800GTX XXX Edition

SPECS

Price **$1099** Street Price **$999**
Supplier **MMT**
Website **www.mmt.com.au**
Specifications **630MHz core, 1000MHz mem (2000MHz effective), 768MB GDDR3, DirectX 10 capable.**

The first overclocked DirectX 10 cards have hit the station from NVIDIA, while AMD is still languishing behind with its oft and still delayed X2K series.

While the original 8800GTXs were clocked at 550MHz core and 1800MHz memory, XFX have managed to squeeze out an extra 80MHz and 200MHz respectively, releasing the highest clocked card on the market. This means some toasty temperatures, with average under load temps operating around the 75°C mark.

Nonetheless the card handles the heat with no issue, comfortably smacking about any test we cared to throw at it, as those of the GTX ilk are wont to do.

In the 3DMark06 SM3.0 tests (4xAA, 8xAF), the card scored 3708, 3015 and 2679 at 1280x1024, 1600x1200 and 1920x1200 respectively, giving an average eight percent performance increase on the vanilla version.

Half Life 2 scored 207.7fps, 186.88fps and 169.93fps at 1280x1024, 1600x1200 and 1920x1200 respectively, giving a six percent increase over the standard clocks.

An inventive person can find a bog standard GTX for about $830 these days, so you have to question whether an average seven percent increase in performance is worth a 17 percent price increase. Still, since XFX have done the hard work for you by weeding out the high performing chips and putting them in the XXX edition, it's likely you'll be able to push these even further again, and further than the stock cards can dream of as they rely more on luck for their overclockability. We managed 649MHz core and 2135MHz memory stable, although this required us to set the fan permanently to 100 percent – not a huge increase, and certainly not worth the noise.

Still, for those who are chasing the ultimate frame rates, need to feed a hungry 30", 2560x1600 monitor, figure SLI is a good idea and own 60 percent of the Bank of Canada, you won't get faster than this, or as it may be, two of these. **CS**

SCORE 8.0 OUT OF 10

ASUS DRW 1814BLT

SPECS

Price **$79** Street Price **$70**
Supplier **ASUS**
Website **www.asus.com.tw**
Specifications **DVD+-R: 18x; DVD-RW: 6x; DVD+RW/+-R (DL): 8x; CD-R: 48x; CD-RW: 32x; DVD-RAM: 14x, LightScribe.**

The ASUS DRW 1814BLT isn't, as some would think, Tchaikovsky's last overture about his favourite fatty sandwich. Instead it's a Mediatek chipset-based DVD burner with LightScribe and the standout points of 18x DVD+-R and 14x DVD-RAM writing.

Its other standout feature, perhaps more so than the others, is it is the first SATA burner to hit our labs. Sure, Plextor has done it before, but being Plextor it wasn't even remotely affordable. Dare we dream it? IDE dead for good?

Plugging in the drive was no issue, with Windows identifying it without skipping a beat. There was also no issue booting the system from the drive on our 680i test bench, showing that recognition is not a problem.

Sound is also not a problem, as during burning and verifying we barely heard a thing compared to our noisy old Pioneer DVR-110D.

Using ImgBurn 2.2.0.0's 'Discovery' mode, we burnt a test disc at 16x using a Taiyo Yuden TYG03 16x DVD-R, graphing the results of the burn in DVDInfoPro. This revealed a CPU usage spike at the point where the drive increased to 12x, and also at the end when closing the disc where it exceeded 20 percent. The rest of the burn averaged four percent CPU usage, the disc completing in six minutes and 12 seconds.

Unfortunately this increase in CPU usage at the end of the disc also meant a vast increase in PI errors according to Nero CD-DVD Speed 4.7.0.0, suggesting some work needs to be done. This result was replicated with older Verbatim 8x DVD-R MCC 02RG20 media. Still, these errors were within acceptable limits, and for a first run firmware this drive is quite nice indeed, ASUS just needing to break out the Caelum and tweak a tiny bit more.

If it's time to upgrade the old writer, at this stage the ASUS is a very attractive buy indeed. **CS**

SCORE 9.0 OUT OF 10

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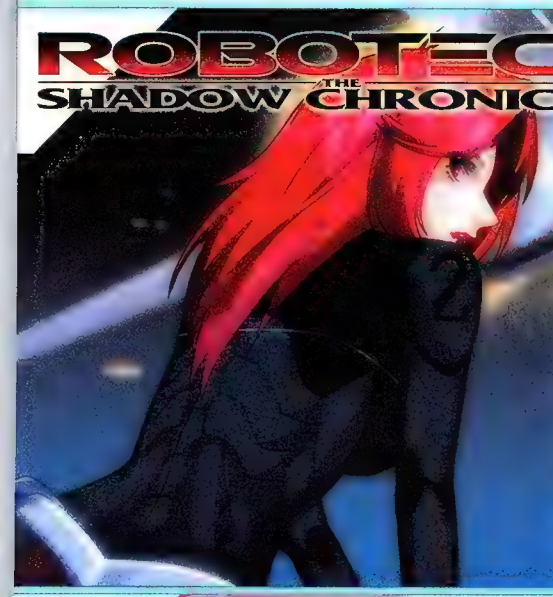

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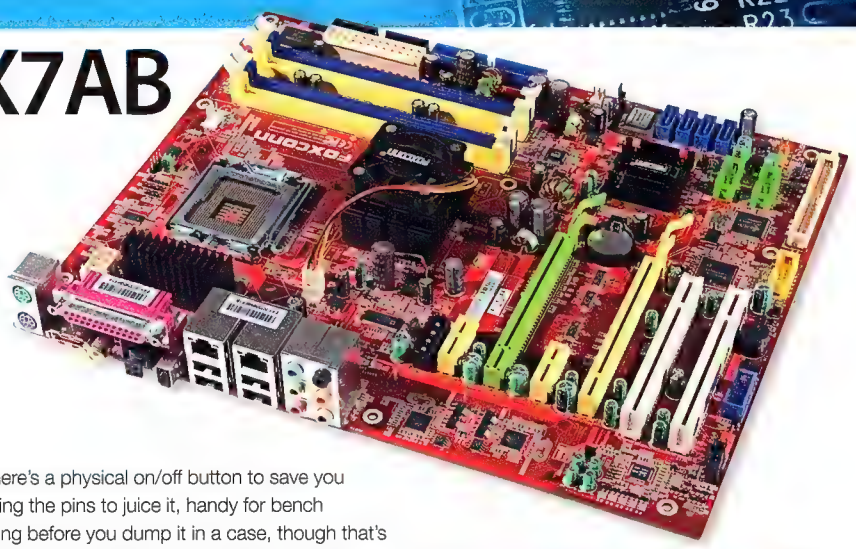

SPECS

Price **$259** Street Price **$259**
Supplier **Foxconn**
Website **www.foxconnchannel.com**
Specifications **975X; 1066 FSB; DDR2 800; CrossFire compatible; 7.1 HAD; Dual GbE LAN; eSATA.**

Turning up too late to be part of Craig's motherboard slugfest last month, we got our mitts on Foxconn's revised 975X7AB board and set the hoops on fire to see how well this puppy would perform.

The is one of the few boards we've seen to include a Digital PWM, Foxconn's Power Management system, which delivers better regulated voltage to the CPU and replaces the need for space-consuming capacitors and MOSFETs around the socket. The advantage is easier installation of oversized heatsinks and waterblocks, while voltage regulation makes it an ideal candidate for overclocking.

There are plenty of features here for tweakers and most are available through the Windows clocking app if you're not comfortable under the hood. Even experienced users will be surprised by some of the options, with Vcore voltage adjustable in three percent increments to a maximum +24 percent. The PCI-E clock and DRAM values are more traditionally tuned.

There's a physical on/off button to save you jumping the pins to juice it, handy for bench building before you dump it in a case, though that's probably the last time you'll use it. Traditionalists can still short the board the old fashioned way with a screwdriver, bottle opener or the fly of their jeans – just watch out for the fan blades.

Resetting the CMOS was a bit fickle on our sample, often taking a couple of clears to take affect, and even successful overclocks took anywhere up to 30 seconds to POST. We managed reasonable results with the board, getting our X6800 to a stable 3.3GHz but had trouble achieving big clocks on lower multipliers.

Board layout is good, with plenty of space between the memory sockets and neighbouring components, although the placement of the PCI-Express 16x lanes means you'll be covering a single PCI-E 1x and one PCI slot if you're running in a CrossFire setup. Due to placement, it can also be difficult to attach SATA cables with longer length graphics cards installed.

A reasonably feature-packed board, its big pull will be price before performance, representing one of the cheapest 975X boards around. **DC**

SCORE **7.0** OUT OF 10

AMD Athlon 64 X2 6000+

SPECS

Price **$1000** Street Price **$970**
Supplier **AMD**
Website **www.amd.com**
Specifications **Dual core; Socket AM2; 90nm; 3GHz; 200MHz FSB; 2MB L2 cache.**

The release of this 3GHz X2 chip from AMD is a surprising one, considering the tough seven months of Core 2 supremacy the CPU giant has faced. That's surprising in a bad way, like when you walk in on your grandmother dressing and it turns out she's a man. A wrinkly, 70 year-old man… with a hernia.

Still on the old 90nm tech, the 6000+ is just a minor speed boost – making us wonder what indeed is the point. Sure it's 200MHz faster and $200 cheaper than granddaddy FX-62, but we're struggling to figure out why this chip at 400MHz more than the 5000+ should be given a rating of 6000+. Something tells us the marketing droids wanted a bigger number to match the competitor's – it's certainly discouraging to see AMD play Intel games.

Performance-wise it's the same old hat we're afraid. Against the $300 cheaper Core 2 Duo E6700 it trails abysmally, with LAME multithreaded completing in 1m 22s compared to 57s, VirtualDubMod in 2m 50s compared to 2m 43s, and SuperPiMod a ridiculously high 3m 12.406s compared to 1m 48.203s. Only Cinebench allowed the 6000+ to play ball, drawing effectively even at 826CB compared to 827CB.

Overclocking showed a chip pretty much already stretched to its limits, the FSB unable to boot into Windows when set above 220MHz on our ASUS M2N32 SLI Deluxe, giving an effective 3225MHz. While this is stable, the E6700 can go higher with little difficulty and be more effective per clock. We're not even going to talk about the potential of the E4300 – it's well documented in this month's feature.

In short the 6000+ is simply not a smart buy, unless you've already significantly invested in AMD infrastructure, or specifically need the higher memory bandwidth of the AM2 platform, which for the majority of home users is not the case. Given this, it's fortunate for AMD that we don't score CPUs – the 6000+ just doesn't deliver the goods. **CS**

> **"Something tells us the marketing droids wanted a bigger number…"**

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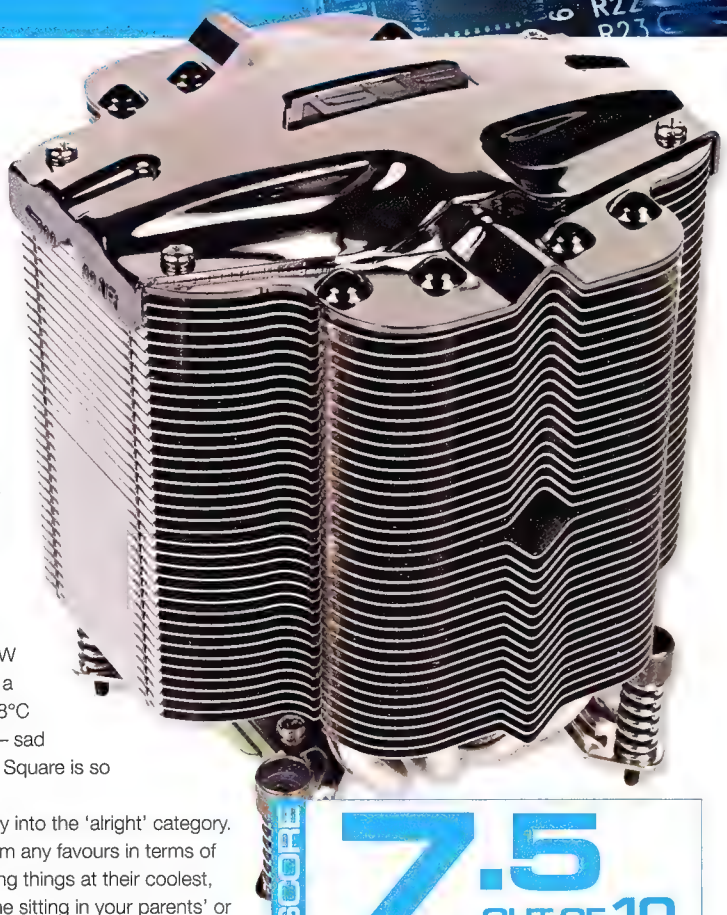
ASUS V60 Cooler



SPECS

Price **$59** Street Price **$59**
Supplier **ASUS**
Website **www.asus.com.tw**
Specifications **Socket 775; 630g; 2300RPM fan; 36.5CFM; 92mm fan.**

ASUS's V60 is like a miniature version of its excellent Silent Square, in essence a giant extruded plus sign shaped out of fins with a 92mm fan embedded squarely in the middle. Much like its older cousin it's constructed of aluminium and features a nickel-plated copper base.

Four heatpipes extend from the top of the heatsink on one side, down to the bottom, across the base and up the other side, giving the impression of some heavy engineering, or something that's been ripped right out of *Star Trek: The Next Generation*.

Noise is not offensive, but it's certainly not the quietest we've heard either, overall falling into the 'tolerable' range. Potentially locked away in something like a P180, you'd never hear it at all. Regardless, we still wouldn't mind a quieter fan.

A custom mount system is used involving an 'x' shaped backplate, and interestingly the screws required come pre-attached to the base of the sink itself. Full marks to ASUS for this one, it's an easy-to-use and workable system, unlike those who follow Intel's horrid clip locks.

The four-pin power connector reveals PWM support is present, allowing a 10 percent speed variance above and below the stock 2300RPM. As usual though when plugged into Chernobyl this is ignored and the fan is run at stock speed.

Placing the sink on Chernobyl which was happily oozing out 80W of heat, the V60 gave a lacklustre 51°C in a 28°C ambient temperature – sad considering the Silent Square is so considerably better.

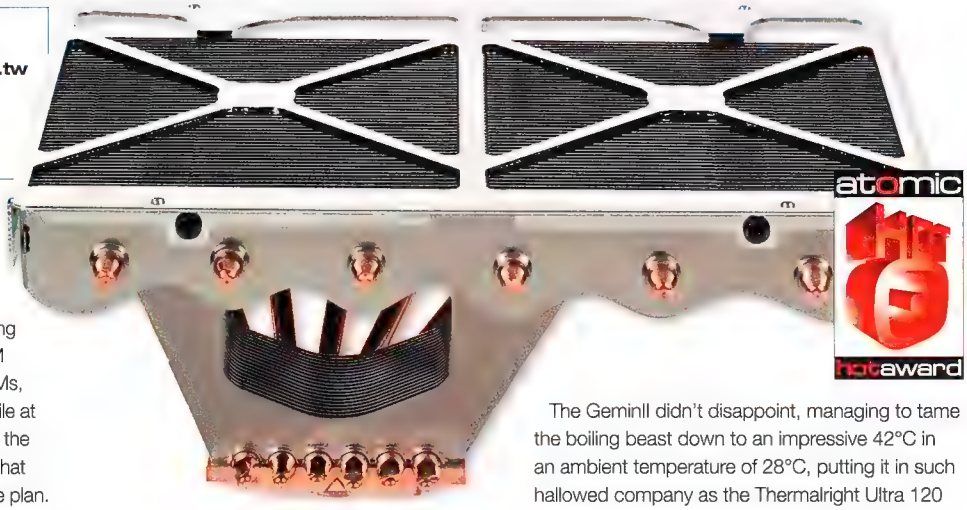
The V60 falls heavily into the 'alright' category. It won't do your system any favours in terms of overclocking or keeping things at their coolest, but it'd certainly be fine sitting in your parents' or sister's machine. **CS**

SCORE 7.5 OUT OF 10

CoolerMaster GeminII

SPECS

Price **$TBD** Street Price **$TBD**
Supplier **Coolermaster**
Website **www.coolermaster.com.tw**
Specifications **Socket 939/ AM2/754/775, 847g, 175x124.6x81.5mm.**



The GeminII is, for want of a better word, huge. Rather than take the skyscraper option of building upwards like the popular tower coolers, CoolerMaster has opted to build outwards, meaning if your fans are pointing down and particularly high CFM that your RAM can get cooled as well, not to mention the VRMs, MOSFETs et al surrounding the processor. While at first you'd think it could be reorientated to cool the northbridge as well on most boards, it seems that the graphics card will get in the way of that little plan.

The horizontal nature of the GeminII means fitting it into some cases will be a challenge as the cooler sits flush with the back of the motherboard for 124.6mm and the top for 175mm, creating potential interference. Attaching two 120mm fans – not supplied – extends the length further to 240mm, with one of the fans hanging off the end of the heatsink. Aluminium fins and a copper base make up the impressive 847g weight, overall creating a monster of a sink that's not for the faint of heart, or weak of liver, yet for some reason feels deceptively light compared to the usual tower coolers.

The mounting system is reasonably straight forward for those who have installed heatsinks before, and those who haven't won't it find too much of a challenge, short of figuring out which way the rails go that are required to attach the 120mm fans. After screwing the two Nexus Real Silent 120mm fans down to said rails, we eased CoolerMaster's latest experiment onto Chernobyl's 80W heat generating slug and awaited the results.

The GeminII didn't disappoint, managing to tame the boiling beast down to an impressive 42°C in an ambient temperature of 28°C, putting it in such hallowed company as the Thermalright Ultra 120 and Thermaltake Big Typhoon VX.

So long as you can fit it in your case and don't fear it ripping the motherboard apart when transporting, the GeminII is an excellent and effective cooler. **CS**

SCORE 9.0 OUT OF 10

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ATOMIC KITLOG

Our choice for the best gear the land has to offer

There's nothing sexier than new kit. And whether you need to horde your pennies (Budget), want the most power for your dollar (Performance) or own a small mansion and a collection of sports cars (Extreme), we're here to help with this handy matrix of *Atomic* recommended products. You may find your needs fall between categories – that's okay, just mix and match to suit your budget! Each piece of kit has been reviewed hands-on in *Atomic*, so if you want to learn more, look up the issue and page number listed.

	CPUs	Motherboards	Memory	Video cards
BUDGET *I can't afford to eat... gimme gear!*	**intel**			
	Intel Core 2 Duo PRICE $300-$830 Stretch a little further and buy yourself a Core 2 Duo – you'll be thanking yourself later. The E6300 is the cheap ticket to speed, at $300.	**ASRock Conroe 945G-DVI** PRICE $113 ASRock's budget board may be using old technology, but it runs the new stuff just fine, and can even overclock a little. Reviewed in *Issue 70 – Page 60*	**Corsair Twin2X 1024MB 6400 Pro** PRICE $220 Corsair has a history of providing nice, stable and fiesty sticks of random access memory joy. These RAM sticks are EPP compliant, have low latency and are nicely overclockable. 800MHz of fun for everyone! Reviewed in *Issue 69 – Page 51*	**Powercolor X1950 Pro** PRICE $285 The X1950 Pro is nothing short of fantastic. Mind you, this could just as easily be the 7950GT, so watch this space in case the NVIDIA card drops in price. Reviewed in *Issue 71 – Page 47*
	AMD			
	AMD Athlon 64 AM2 X2 PRICE $250-$650 Cheap CPUs are a wonderful thing, and the X2s are now wonderfully cheap. The 3600+ is your budget baby at about $230.	**MSI K9N Neo** PRICE $101 Excellent performance from a budget board, with plenty of legacy slots for upgraders. Don't expect to overclock though. Reviewed in *Issue 68 – Page 33*		
PERFORMANCE *Hardware that bangs the best for buck.*	**intel**			
	Intel Core 2 Duo PRICE $300-$830 Core 2 Duo – crazily fast, crazily cool, crazily affordable, overclockable like buggery. The E6400 is the best buy, at about $400.	**Gigabyte GA-965P-DS3P** PRICE $226 The 965P-DS3P is a ridiculous overclocker that can't be ignored. Buy a low-end Core 2 and go nuts! Reviewed in *Issue 74 – Page 46*	**Corsair Twin2X 2048MB 6400 Pro** PRICE $372 Yes, these are the same sticks recommended for the Budget system. Sadly, they are also the only RAM sticks we've tested that are compatible with AM2 and Conroe. So until we get more in, the Corsairs will stay. Reviewed in *Issue 69 – Page 51*	**GeForce 8800GTS** PRICE $570 DirectX 10 for the mainstream. It's a bit of a stretch financially, but will keep you happy for years to come. Fingers crossed for further price drops soon. Reviewed in *Issue 72 – Page 30*
	AMD			
	AMD Athlon 64 AM2 X2 PRICE $250-$650 The X2 series are still fantastic chips, and in the face of the Intel threat are now going for cheap. The 4600+ is your current sweet spot at about $400.	**Gigabyte GA-M59SLI-S5** PRICE $221 Gigabyte delivers yet another affordable, feature-filled wonder of the 21st century. Reviewed in *Issue 66 – Page 39*		
EXTREME *Gimme power. Money is no object.*	**intel**			
	Intel Core 2 Quad QX6700 PRICE $1440 It may be clocked slightly slower than the X6800, but it overclocks fine and has double the cores! Reviewed in *Issue 72 – Page 46*	**EVGA nForce 680i** PRICE $419 Stupidly over-featured and fast, if you've got the cash, then plonk it down here. Reviewed in *Issue 72 – Page 47*	**OCZ Titanium Alpha VX2** PRICE $720 Oil slick coloured sticks are slick as their rainbow colours show. Make sure your mobo can hit the 2.3V required to power them! Reviewed in *Issue 72 – Page 52*	**GeForce 8800GTX SLI** PRICE $850x2 The next generation is here, and it kicks arse. While we're still waiting for DX10 applications, for DX9 the thing utterly destroys the competition, providing you have a beastly CPU. Reviewed in *Issue 72 – Page 30*
	AMD			
	AMD Athlon 64 FX-62 PRICE $1130 Sadly gets beaten by a mid range Core 2 Duo, but still the top of AMD's pile. Reviewed in *Issue 66 – Page 39*	**ASUS M2N32 SLI Deluxe** PRICE $295 Perfection in a motherboard. Beautifully laid out and overclockable to boot. Reviewed in *Issue 68 – Page 35*		

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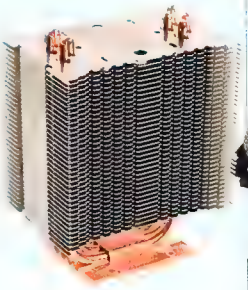
Coolers



Noctua NH-U9
PRICE $60

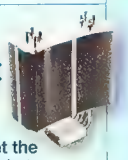
It may only be 90mm, but its cooling power is exemplary, coming in only slightly behind its 120mm brother.

Reviewed in *Issue 72 – Page 42*

Thermalright Ultra 120
PRICE $75

Tower cooling that will keep your tower cool. Whack a Nexus 120mm fan on for near silent cooling.

Reviewed in *Issue 72 – Page 42*



Thermalright Ultra 120
PRICE $85

Make sure you get the optional AM2 bracket (hence the higher price). Grab that same Nexus fan.

Reviewed in *Issue 72 – Page 42*

Asetek Vapochill Lightspeed
PRICE $1160

Vapour phase change. Ooooh. Vapour. Phase. Change. No matter how many times you say it, it's still cool (pun!)

Reviewed in *Issue 64 – Page 38*

Cool-Trek Vostok
PRICE $199

Until more extreme cooling systems come along that are AM2 compatible, this little kit will have to fill the gap. Make sure you get the updated mounting kit.

Reviewed in *Issue 68 – Page 41*

System drives

Samsung HD160JJ 160GB
PRICE $90

Super quiet and yet still fast, the 160GB Samsung offers excellent value for money.

Reviewed in *Issue 69 – Page 40*

Seagate Barracuda 7200.10 320GB
PRICE $150

Seagate's fancy new technology makes this beast both fat and fast. We're almost at 1TB!

Reviewed in *Issue 69 – Page 40*

Western Digital Raptor WD1500ADFD
PRICE $380x2

Dear lord. The performance king hath cometh, short of whacking in a SCSI. Buy two and RAID 'em.

Reviewed in *Issue 62 – Page 40*

Displays

Samsung 931C
PRICE $450

2ms of raging colour gamuts and beautifully smooth tonality that will make you weep with joy and hug strangers.

Reviewed in *Issue 70 – Page 56*

Samsung 244T
PRICE $1485

Brilliance at 24", the 244T offers 6ms gaming, a wonderful gamut and more inputs than an alien hooker.

Reviewed in *Issue 69 – Page 48*

Dell 3007WFP-HC
PRICE $2899

Thirty inches, 2560x1600, 11ms G2G. If you can handle the size and cost to run this massive beauty, you won't be disappointed.

Reviewed in *Issue 74 – Page 52*

Speakers

Steelsound 5Hv2
PRICE $120

Awesome gaming audio performance on a shoestring budget. Phenomenal 'phones.

Reviewed in *Issue 73 – Page 43*

AVLabs AVL325
PRICE $210

While it can't hold a candle to the Z-5500D, with a price this low there's no excuse not to jump to 5.1.

Reviewed in *Issue 64 – Page 50*

Logitech Z-5500D
PRICE $440

Able to play the 'liquid gold' that is DTS 96KHz/24-bit, this 5.1 beast can wreck both home and hearing alike with equal impunity.

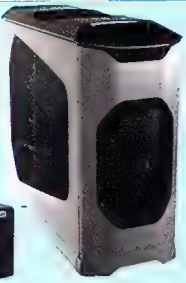
Reviewed in *Issue 48 – Page 56*

Cases

Cooler Master Ammo 533
PRICE $95

Perfect for LANs with its heavy duty handle, military styling and rugged construction, the Ammo blasts the budget competition away.

Reviewed in *Issue 60 – Page 50*



Cooler Master Stacker 830
PRICE $290

Like the Stacker before it, this sensational Stacker stacks sumptuous specifications salaciously.

Reviewed in *Issue 61 – Page 36*

Silverstone TJ07
PRICE $420

The Silverstone Temjin TJ07 is a huge hulking beast that shows you mean business in the finest style. Impeccable finish and plenty of room means win.

Reviewed in *Issue 65 – Page 49*

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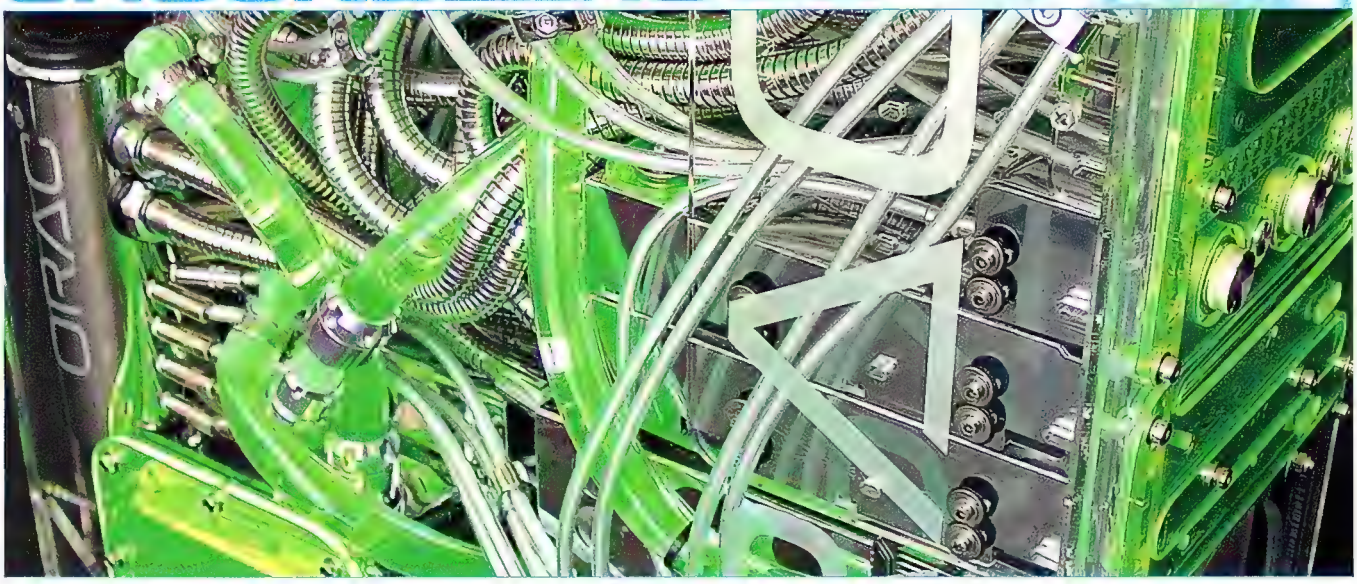
GROUNDZERO

Dan talks tech like you've never heard before



Water power

Daniel Rutter wants the ring that that Planeteer had. You know, the Asian one.

The other day, someone asked me whether I thought it was a good idea to water-cool a PC power supply.

It's not as crazy as it sounds. People have done it. A water block on every heatsink and a bit of convection to keep the rest of the PSU components cool.

It's still not a very desirable project though, and it pays to understand why, even if you're not considering plugging a garden hose into your PSU.

All normal liquid-cooling systems, be they for a car, a computer or a nuclear power station, use the liquid only to *move* heat from a place where it's inconvenient to deal with it to a place where it's easier.

Now, a CPU is relatively small and buried inside the computer, and generates a lot of heat. So it makes some sense to put a water block on it and pipe its heat to a nice big radiator cooled by a nice big fan which you can hang outside the computer case. Or outside the building, if you prefer.

On the other hand, a PSU is relatively large, has its own exhaust and does not make all that much heat, anyway. Modern PSUs can be expected to be running at better than 80 percent efficiency at most load levels. If you have a 500W PSU running at full power at only 80 percent efficiency, then there's 100 watts of heat to get rid of. But a recent fire-breathing machine still only needs about 400 watts when it's working hard, and most computers most of the time need only a couple of hundred, tops.

> "If your PSU's losing more than 50 watts as heat when driving a 200W load, then it's a very bad PSU."

If your PSU's losing more than 50 watts as heat when driving a 200W load, then it's a very bad PSU. Twenty-five watts lost should be perfectly achievable. And you can get rid of a few tens of watts of heat from a device the size of a PSU – plus all of the leftover heat from the extra components in a PC – with a fan that's considerably quieter than the ones that most water-cooled PCs have on their radiators.

Which brings me to the next problem. Your computer *needs* something to get rid of the heat from those other components. If you delete all the intake and exhaust fans, then you're left with nothing but convection to cool everything that doesn't have a water block. That means you either have to use a case with very good ventilation – just leaving the side panel off may not be enough – or extend your water-cooling system to motherboard chips, hard drives, RAM…

If the aim of your water-cooling exercise is to make a PC that isn't audible over the sound of the big lazy fan on the radiator, then you'll do better to get one of the off-the-shelf PSUs that have their own big, slow and quiet fans. If the water rig takes care of the CPU and video card heat, the case has reasonable ventilation, and the ambient temperature isn't alarmingly high, then one quiet temperature-sensing fan in the PSU should be able to keep everything else decently cool.

If you're a fanatic that insists on a fanless – and thus bigger – radiator, then even a PSU fan's noise may be unacceptable to you, and you may indeed need to water-cool *everything*. If that requires you to use a bigger pump that makes more noise, though, don't come complaining to me.

A better solution to this problem is to stick with fans, but move them further away. Long water pipes to a remote-fanned radiator can be a pain, but it's quite easy to use bendy HVAC ducting leading to a fan in another room or outdoors.

This opens up another crazy-project option.

Rig a reversible outdoor fan with an in/out temperature sensor. Now the fan can blow air into the computer when it's cool outside, and suck air out when it's hot!

Are you a big, slow and quiet fan of Dan? Why don't you drop him a big, slow, quiet email?
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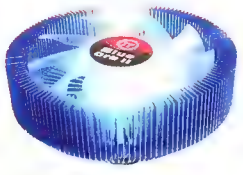

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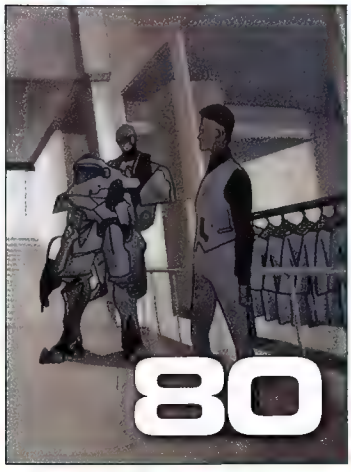
505 GAMES

GAMEPLAY

GAMES, GAMING AND GAMERS COVERED *ATOMIC*-STYLE

Are we surprised that there's another MMO review in Gameplay this month? Not really. In fact, don't be surprised if there's another next month.

Whether they're *good*, well that's a different question entirely. Rating an MMO can be tricky just a month or so into release, considering how most, including World of Warcraft, EverQuest and Ultima Online have evolved since their ham-fisted beginnings. Vanguard is in the same boat, so keep this in mind when you read the review. We also had a chance to check out The Darkness, a comic-based FPS coming to an Xbox 360 or PS3 near you. If you're a fan of Top Cow, then be sure to read Engine Room.



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Logan Booker finds out why next-gen darkness is scarier than current-gen.

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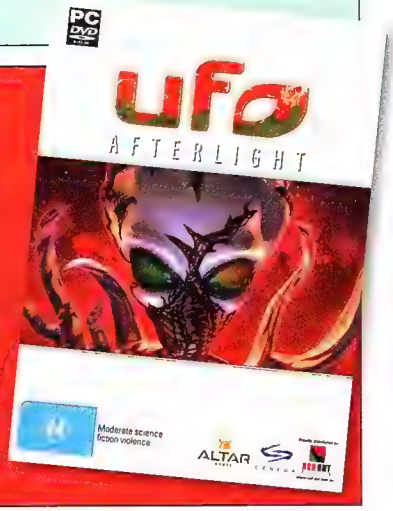


DARK PORTENTS

Logan Booker does his best to hide from The Darkness developer Jens Andersson, while still asking him a quivering question or two.

Exactly how dark is dark? Enough to be scared. Enough that you can't see your hands in front of your face. Enough that the mysterious sounds in the distance could very well be a manboar sucking the marrow from your brother's bones.

Or, it could be The Darkness.

PAPER TO PC

The Darkness comic was launched back in 1996 by Top Cow Productions, where it met considerable success, matching the likes of TCP's other titles *Witchblade* and *Rising Stars*.

Mafia don Jackie Estacado is the main protagonist and plays host to an ancient, supernatural power known as The Darkness. Estacado can manipulate The Darkness to a number of ends, including creating solid objects (even a functional gun), tentacles, armour and thinking creatures. All Estacado needs is the presence of darkness. Sadly, anything created by Estacado dissolves on contact with light.

According to the comic series, The Darkness is passed on from father to son, when the child is conceived, killing the previous owner in the process. On the child's 21st birthday, the force manifests itself for fun and profit.

Developer Starbreeze has taken it on itself to turn TCP's creation into a console game. Set for release on Xbox 360 and PlayStation3, The Darkness should push these next-generation systems to their limits.

A MAN AND HIS MAFIA

If the name Starbreeze rings a bell, it should. The company worked on the excellent Chronicles of Riddick: Escape from Butcher Bay. Butcher Bay combined cutting-edge graphics – superior to those of the yet to be released Doom 3 – with a story critics believed bettered the movie it was based on.

For The Darkness, Starbreeze will be loosely following the content of the comics, with a focus on the maturing of Estacado's powers. As Jackie learns of his new abilities the player will too.

'The Darkness is an action/adventure and while a lot of focus has been spent on the action with the shooting and The Darkness powers, a thing that I think will separate it from other games is the story and the adventure parts,' explains Jens Andersson, lead designer on the title.

According to Andersson, gameplay will vary from non-linear sequences with scripting to progress the story, to open-ended areas where you can take events at your own pace. Various New York locations will be fleshed out, providing plenty of environments to check out.

'The story will also guide you and while it should be rather obvious where your next story-point is, you are encouraged to explore and help out people around you. We've tried to make sure to allow for many playing styles, from people who just want to blast through the game, people who want to get the most out of the story and people who just want to play on their own terms,' says Andersson.

Estacado's demonic power, however, isn't going to rest dormant – players will have to fight for control over The Darkness in order to get it to behave. This is reflected in-game by The Darkness temporarily taking hold of Jackie, leaving the player to watch, and sometimes cry. You will have to learn the extent of your newly-found supernatural abilities before you can really get down to business.

How exactly does The Darkness work then? Andersson provides details.

'Whenever the player is in the dark, or creates darkness by taking out lights around him, he can press a button to draw power from that darkness. This allows him to be temporarily possessed by The Darkness and use

Above left 'Check out my fancy guns, wiseguy.'
Above Red Dwarf halts filming to visit the Big Apple.
Below Night patrol for the NYPD just got a little scarier.

Above Darklings are mischievous and need disciplining. Below Chinatown's a lovely 'safe' place to go for a late night stroll. Below right Darklings can offer great 'help'.

spectacular abilities. He can also summon Darklings, really evil little creatures that can be found in dark areas of the game and they will help in their own mischievous ways.'

Other uses for The Darkness include creating giant tentacles to break down walls, crush, toss and beat on opponents and to deflect projectiles.

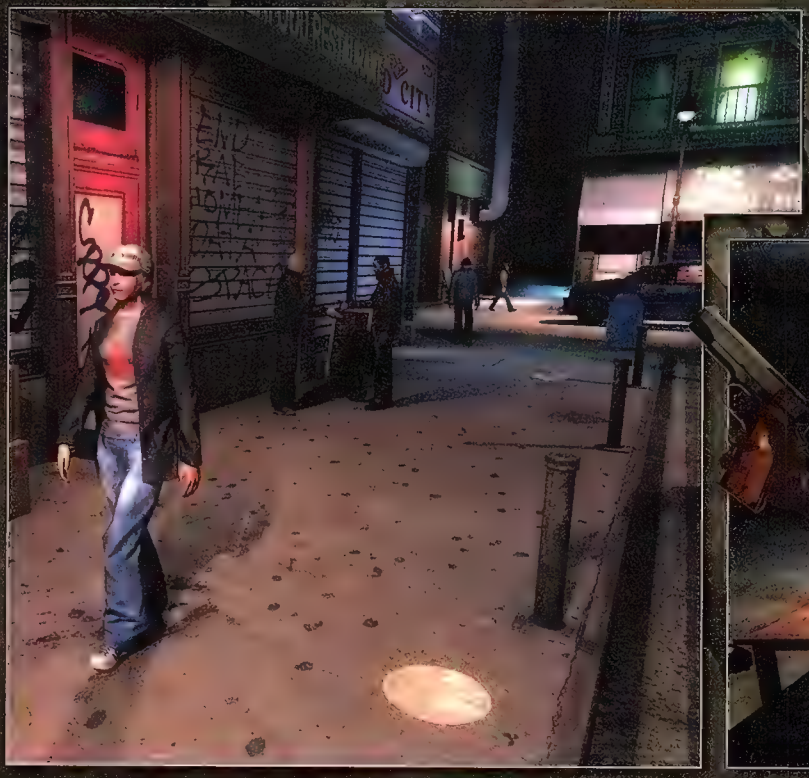
'[You can] even implode a whole room, with people and furniture alike,' says Andersson.

Black is the new black

The Darkness will be built on the foundations of the same engine Starbreeze used to create Chronicles of Riddick. The developer has of course made various improvements to accommodate updated technology since the release of Riddick, but the team has also had to add a few new elements to bring to life Estacado's dark powers. Andersson mentions that building both the game and modifying the engine to support next-gen has proved somewhat demanding.

'One of the biggest changes you'll see with most new-generation engines is that of going from polygon-based detail towards normal-mapped. Instead of having to use tens of thousands resource-intensive polygons to create a realistic model you can move a lot of detail into textures that stores the geometrical changes over an individual polygon using a normal map,' explains Andersson.

'To create this normal map, we use a high resolution model for each object in the game, be it a weapon, character or just the floor-tiling, that usually consist of millions of polygons, and reduce that to a normal-map that is rendered over much fewer polygons (a couple of thousand for a character). These are then rendered in realtime, but with a lot of the detail from the high resolution model kept intact since we can replicate it using normal-map and the way we render lighting.' This is the technology that Doom 3 made famous, and was significant in making Chronicles of Riddick a standout game visually.



Starbreeze knew from the get-go that normal mapping was not going to be enough. With The Darkness' unique requirements, the developer knew that the dynamic lighting and shadowing components of the engine would need special attention. Trying to make the effects realistic and malleable enough in-game and keeping the frame rate up was going to be a challenge.

'There's a range of ways you could do dynamic lighting and shadows and in most there is a trade-off between performance and how dynamic they are, so while we only had stencil point and spotlights available for use in Riddick we also included light-field mapping in [The] Darkness. Light-field mapping is similar to the lighting technology used in Half-Life 2 and is great if you want to do big outdoor areas with ambient lighting that doesn't require the lights to be dynamic,' says Andersson.

Further to this, Starbreeze has the ability to tailor the type of technology used on a per-light basis, providing maximum flexibility when design levels and creating areas where the player must leverage the use of darkness. Starbreeze understood that to really craft some interesting battle scenes, it would have to go to extremes with its light and shadow rendering methodologies.

'As the gameplay is really about creating darkness around you we had to make sure we had the technology to allow that. One choice that we took, as compared to Unreal Engine 3, is that we stayed with the stencil shadowing technique that we used in Riddick. A lot of new-generation engines use shadow-buffer, which makes it easier to produce soft-shadows, but for the scenes we wanted to do where every light should be dynamic that wasn't an option. This was partly because of how the Xbox 360 graphics hardware is designed where they have a specially designed memory for the render-target.'

As you would expect from next-gen tech, The Darkness will support rigid-body physics, high dynamic range and cloth rendering. Andersson also mentions that Starbreeze

Above left This is Eddie, but he doesn't run Channel Nine. Above Just be grateful that it's too dark to see his face properly. Below For a truly scary experience, try the Subway.

Top Giant tentacles can come in handy... so to speak. Above No need to clean the kitchen if you keep the lights off. Below Kings X streetwalkers and Darklings... spot the difference.

will employ 'semi-deferred rendering', which will make the game look even more real.

'Semi-deferred rendering is a cool feature that allows us to modify the materials that are usually static, something like advanced decals. Each basic material is rendered using three basic textures: diffuse, specular and normal, and with the semi-deferred rendering we can modify only one of these materials. For example, we can amplify the specular property using a decal to make it look like a wall has been hit by a water balloon, or modify the normal map to create bullet dents in a metal wall, or just modify the diffuse to simulate spray-paint without changing the rest of the material properties.'

Graphics, as we all know, isn't the be-all-end-all of a game. With the amount of atmosphere The Darkness will demand, Starbreeze has devoted quality time to sound and animation.

'We have always had a lot of focus on believability in our games. The world should look real and the characters should feel real,' says Andersson.

'One thing that worked really well in our previous game was that each character had a unique model and voice which directly gave them a sense of personality. To take this further in The Darkness we've doing something we call VoCap, where we simultaneously record both voice as well as full facial and body motion capture for every line in the game. This gives a tremendous improvement in the believability of the characters in the game.'

Night and day

While the PC will miss out on The Darkness, console owners will be happy to know that both the Xbox 360 and PS3 will receive the game. According to Starbreeze, the two versions will be identical, or at least very similar, the only differences being visual due to the hardware.

'We've intentionally tried to make the PlayStation3 version as similar to the Xbox 360 version as possible. This is partly because they will be released simultaneously and you run into fewer problems the more alike they are. Luckily for us, the performance of the two consoles is rather similar with our engine, which makes that job easier. The biggest difference we've run into is the more limited disc-space on the Xbox 360, but that is hopefully something we can solve by putting some more work in compressing our data,' says Andersson.

Without a shadow of doubt...

With the next-generation of consoles almost with us – here in Oz at least – The Darkness should make a beautiful if not supremely enjoyable addition to our top games to play this year. With the pedigree of Chronicles of Riddick, and a story pulled directly from the best in the comic world, we find it hard to believe the game won't be good, if not fantastic. Publisher Take 2 is confident of a release in late March, so the game should be available by the time you read this, or shortly after.

We just hope it won't be *too* dark.

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'I want that one, there!'
'That's not a boat sir... that's, uh, that's a lighthouse.'
'Give me results Vincent, not excuses!'

Europa Universalis III

David Kidd conquers Paradox's latest.

With Europa Universalis, Paradox Interactive created a breed of strategy game that shouldn't work. The game played out in realtime, letting you select any European country (and other regions, too) at any moment in a defined slice of European history. From there, you waded through screen after screen of sliders, making slight adjustments as the clock ticked on, and scratching your head wondering what difference you were making. It attempted too much, lacked defined goals, took weeks to learn, and ultimately left you feeling like running a real country would be easier.

But this strange historical simulator not only created a legion of loyal fans, but spawned a genre unto itself, including spin-offs for different time periods. Despite these variants, EU is still the flagship series for Paradox Interactive, and with EU III, we're treated to a whole new engine, a shallower learning curve and, thankfully, a more streamlined interface, befitting of a game rather than a spreadsheet.

The basic core gameplay is relatively unchanged, though the time period (1453 to 1789) is slightly smaller than EU II. Winning the game can be achieved by making your nation number one in the world rankings, but after a couple of games you'll want to set your own goals. For example, you could start as Portugal, turn to the East, and tackle Castile and Aragon (which, historically joined together alongside Leon and Navarre to form Spain in the early sixteenth century). Or, you could build up a relationship with your neighbours so they won't invade you, then pack up into some ships, head due West, put your flag in the New World, and colonise North and South America.

Once you have your lofty goal, there are numerous ways you can go about achieving it. The first is to turn your nation into one that

will fulfil your needs – an abstract statement, but it underpins every action you take in EU. What's your major religion? Are you tolerant of other religions? What system of government should you choose? Are you geared towards military dominance, or do you want to build a trade empire? Between adjusting your economy, focusing research and adopting powerful National Ideas, you have an overwhelming amount of control over how your empire functions.

With so many elements to keep track of, Paradox has fortunately worked hard on the interface. The new 'ledger', for example, sits in the top right and essentially acts as an automatic bookmark list. Finding a Centre of Trade or zipping over to your new army is a click away.

Also, via the extensive tooltip overlays, you're not left in the dark about how each incremental change affects your nation – just hover your mouse over the proposed change and you'll see exactly what's affected. You'll still need a firm grasp of how all elements interact, but this makes the learning curve gentler.

The most serious factor you'll need to watch is your Stability rating, which affects your finances, productivity, and other major facets. The most common hit to Stability comes from war, or more accurately, waging war without cause.

In EU III, you can't just declare war on someone without a reason, or *casus bellis*, lest you anger your citizens. To gain casus bellis, and consequently avoid a Stability drop, you'll need to pull out every political trick you can. This could be forming an alliance with your enemy's enemy, so when he's attacked, you gain automatic casus bellis. Alternatively, you could set up a royal marriage, then use your new family ties to claim their throne (but if you do, anyone else with a royal marriage will get a bit edgy). This diplomatic intrigue is fascinating in itself. Creating a *reason* to go to war is just as compelling as waging it.

Once you've declared war you'll use land and naval forces to invade and blockade enemy territories. This is abstracted to dice rolls, and affected by army breakdown, terrain type, and morale. To stop you rolling a couple of huge armies around the map, each territory has a supply rating – if your army is bigger than the supply in a territory, you'll take an attrition hit. It's a refreshing take on strategic conquering but it'll take some getting used to.

EU III has so many dimensions that perfectly intertwine. Whether you're waging war, conducting diplomacy, or tending to your merchant empire, Paradox has delivered a new take on the mechanics, making it compelling at every tick of the clock. Unfortunately, these same new mechanics can also act as a barrier to players new to Paradox's thinking, and while it's the most streamlined and attractive version, it still needs more polish, better documentation, and a healthy round of patches.

For existing Paradox fans, it's a must. For everyone else, persist with it. It's a rewarding and thoughtful game that you won't find anywhere else.

Combat requires you to impale your enemies' heads with giant flags.

PC

Developer **Paradox Interactive**
Publisher **Auran**
Website **www.paradoxplaza.com**

Recommended
1.9GHz CPU; 1GB RAM; DirectX 9 graphics

VERDICT

Welcome improvements, no-brainer for EU fans, could replace an entire history faculty.

Bugs; poor manual; still impenetrable for new players.

SCORE **8.5** OUT OF 10

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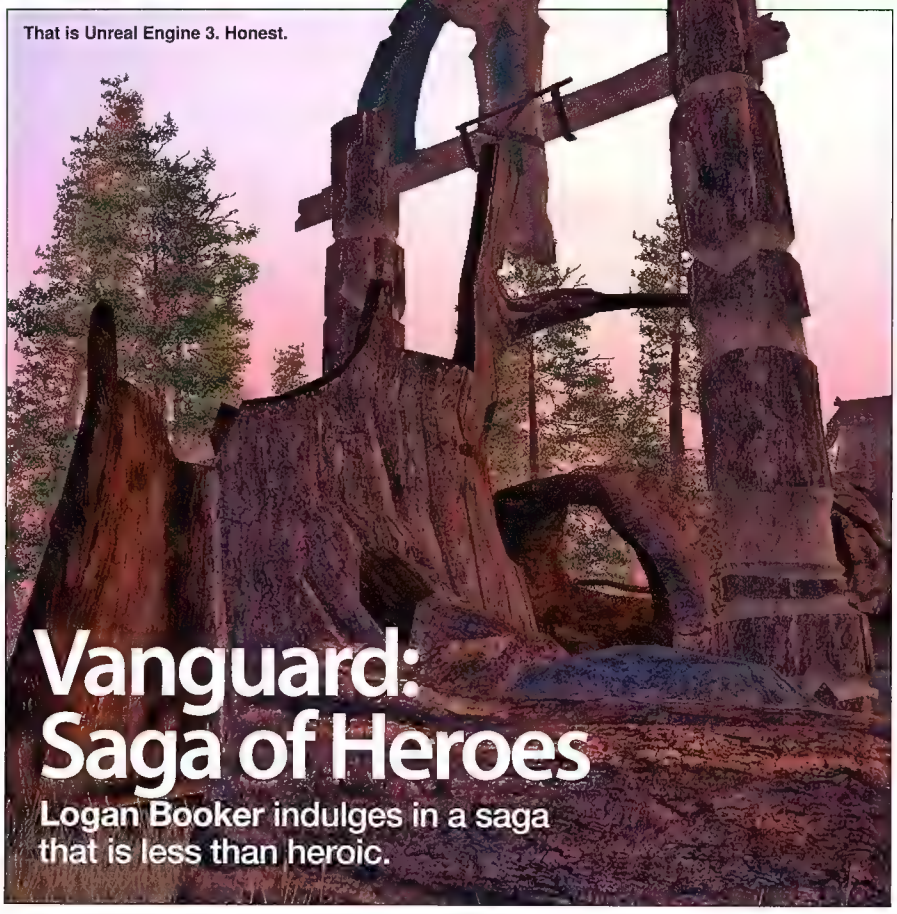


That is Unreal Engine 3. Honest.

Vanguard: Saga of Heroes

Logan Booker indulges in a saga that is less than heroic.

Playing a new massively multiplayer online game isn't as exciting a proposition as it used to be. Once labours of love, publishers have realised that MMOs are veritable cash cows just waiting to be milked until their dollar-disgorging udders are drier than a grain of sand in the vacuum of deep space. The effect of this is titles are pushed out months before they're ready, developers taking advantage of the online nature of the genre to patch in features at a later date. Sigil's Vanguard: Saga of Heroes is a good example of a game that was released with such a strategy in mind.

Vanguard takes place in the world of Telon, which is comprised of three very different continents. Each continent is home to about three to five races, and it's with this element that Vanguard separates itself from the MMO crowd – the game packing 19 playable races including wolfmen, orcs, goblins and humans, and 15 unique classes.

Each class is divided into four categories – defensive melee, offensive melee, offensive caster and healer. A few, such as the Disciple and the Cleric, straddle the line between caster and melee, but for the most part each profession is well-defined.

With so much variety, one might question if Sigil has sacrificed quality over quantity. The non-inclusion of two of the planned classes only provides further evidence for this line of thinking.

Vanguard thankfully is reasonably complete out of the box, but we did hit a wall of patches soon after creating a Sony Station account (required to play, needs a credit card, boo) and logging in. On a 24Mb ADSL connection, it still took a good 45 minutes to get completely up-to-date. On a positive note, Sigil looks to be doing semi-daily patching, but you could just put this down to the game's newness rather than the pursuit of raw improvement.

Character generation is very fulfilling. It's not quite as in-depth as NCSoft's City of Heroes, but more satisfying than World of Warcraft. Along with class and race, the player can configure

height, weight and, taking a page from Oblivion, a large number of facial features. In the end, it is unlikely two players in-game will look at all similar and if you can't be arsed fiddling with all the settings or just looking for inspiration, a randomise button is available.

The game proper is a bit of a mixed bag. Vanguard makes no attempt at all to mask what it has borrowed from Blizzard's WoW. The interface is scarily similar, as are the basic combat and NPC interaction mechanics. While not original, it provides a gentle learning curve for players coming across from what is undoubtedly Vanguard's greatest competitor and allows the game to easily introduce its more advanced elements.

One such element in the concept of 'spheres', of which there are three to manage: Adventuring, Crafting and Diplomacy. Each sphere can be levelled to increase the number of abilities it contains, as well as the player's efficiency in that skill. The first is fairly self-explanatory, and is the sphere you'll likely spend the most time improving. The Crafting sphere is a sub-game in itself, and requires more than just a bunch of materials and a 'Create' button. A player must engage in a number of steps to craft an item, dealing with mishaps and complications along the way. Finally, players can try their hand at Diplomacy. While its advantages have yet to be properly defined in-game, Diplomacy involves a

Do they actually look real? Or more like GI Joe dolls?

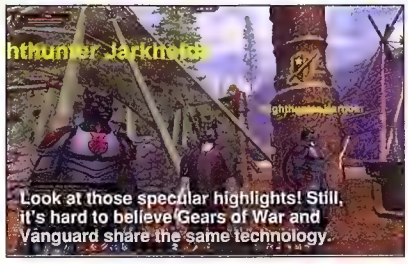
QUALITY CONUNDRUM

Based on Unreal Engine 3, Vanguard can look extremely pretty when the graphics are set to maximum. Indeed, there is a crazy number of graphical options to tweak. As usual, turning off/down shadow and lighting detail provides the greatest frame rate boost.

If you're feeling lazy, the game has a number of video profiles including Best Performance, Balanced and Highest Quality. We found Balanced actually did provide a good compromise between visual splendour and frame rates, while Best Performance looked hideous and Highest Quality made our eyes bleed at the razor sharp levels of anisotropic filtering. Here are some images to help you make the comparison:

Best Performance makes Vanguard look, well, five years old. It's smooth as silk underpants though.

On Balanced, you'd guess that Unreal Engine 3 was only a year or two old.

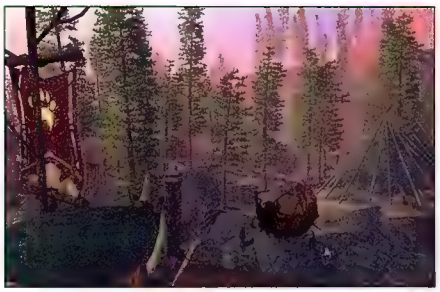

Look at those specular highlights! Still, it's hard to believe Gears of War and Vanguard share the same technology.

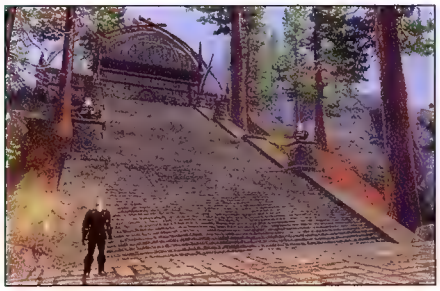
card game mechanic where players must 'play their hand' correctly to influence their opponents. Sigil has mentioned that this will eventually develop a player versus player element.

The combat system is where perhaps the most work has been done. Vanguard sets out to really differentiate itself in this regard, and does so successfully. It's hard to say if it's better than other MMOs, but it is certainly unique. For example, players can select both an offensive and defensive target. If you're a healer, you can select the main tank as your defensive target, and whatever he or she happens to be bashing as your offensive target. You can then not only monitor the health of the tank, but also contribute to the fight. Vanguard also supports a 'combo' system, where if you're competent enough, you can deal extra damage by combining 'openers', 'bridges' and 'finishers'. Combat is also less random and more tactical. A player's perception ability allows them to see upcoming attacks and spells, and counteract them in a planned fashion instead of scrambling for a panic button or fast heal.

Sadly, as much as Vanguard aspires to be the most innovative MMO of the year, it doesn't do enough to separate itself. A lack of polish in design (two missing classes, diplomacy system), numerous bugs (alt-tabbing is simply not possible, and the game does enjoy the odd crash) and a UI that needs some improvement (and be less of a direct rip-off of an interface which is itself not great) leaves it struggling. Give it three to six months to get out of its second beta and we have no doubt the game will show a lot more promise.

If dying was a fun activity, this would be an excellent pastime.





Developer **Sigil Online Games**
Publisher **Red Ant**
Website **www.vanguardsoh.com**

Recommended
2GHz CPU; 1GB RAM; DirectX 9-capable card; Internet connection.

VERDICT

Diverse range of classes and races; expansive world; Unreal Engine 3.

Feels and looks a bit 'fake'; lacks polish; prone to crashing; very derivative.

SCORE **7.5** OUT OF 10

A cel-shaded character wearing shades... are we the only people who see the funny?

Crackdown

Chris Booker can leap over small obstacles with several planned jumps.

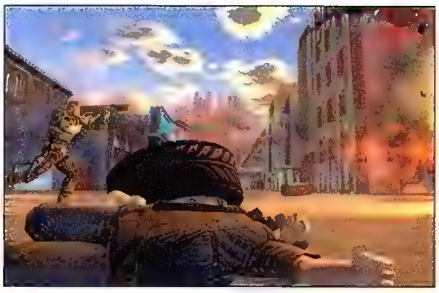
Superhumans. They're everywhere. You can't walk down the street without someone throwing a car to take out a fleeing foe, or leaping a tall building in a single bound. Why? Because they're cool!

A weapon that can blow up the world, while making an excellent plot line, isn't entertaining. The entertainment comes from the dude with super-fast regenerative abilities, adamantium claws and bad-arse attitude who has to stop it in time. In Crackdown, you get to play the role of superhuman.

The plot is fairly simple. You're an agent in 'The Agency', an organisation put together to stem the ever increasing flow of crime. Your objective is to find and eliminate key individuals in the city's three major crime syndicates. The ultimate objective is to kill the head of each organisation and while you can go straight for them, you'll be going up against near impossible odds in the form of extra powerful guards and defences. By taking out individuals lower down in the organisation first, it will soften up the defences around each crime lord in the form of fewer and weaker guards.

The player has five core skills: Athletics, Strength, Marksmanship, Explosives and Driving. These skills increase as you dispatch your foes, allowing you to perform even more amazing feats. For example, with Strength, at its base level you can beat up an enemy in two or three punches or pick up a barrel and toss it a few metres. At its highest level, a single punch will send opponents flying and you can easily hoist a truck above your head and throw it at an enemy three stories up. With Athletics, you go from jumping over cars to leaping from building to building Spider-Man style. Marksmanship improves your aim with

Yes, because it's completely possible to knock over a monster buggy with a shotgun blast.



weapons, Explosives makes your explosions bigger and finally Driving makes the vehicles you commandeer move and turn faster, and upgrades your default automobile.

Gameplay is set out GTA-style, albeit with more freedom and interactivity. You have free rein in a big city, where you can travel over rooftops, grab a car or simply hoof it to wherever you need to be. In between you'll engage gang members and participate in rooftop or road races to increase your Athletics and Driving skills.

The graphics are pretty-looking, but don't really make the most of the Xbox 360's capabilities. The environments aren't too shabby, and the characters have a kind of cel-shaded look to them, giving the game a slight comic-book feel. Essentially you won't associate Crackdown with the words 'Best Graphics 2007'.

At least picking out your foes isn't hard, as each gang member has a coloured icon above them, so they are easy to distinguish.

The real strength of Crackdown is simply playing what's in effect a futurised superhero, and the skill development. It's good fun throwing a truck at a group of people and watching them go flying or leaping off a building into the middle of a group of thugs, cracking the pavement Matrix style, and then booting them over the street. Not terribly complex admittedly, but we enjoyed it.

It doesn't have a lot of depth and the fights aren't very challenging due to you being so damn tough, but if you like playing a one-man army with super strength, incredible reflexes and like cinematic fight scenes, then you will enjoy Crackdown a hell of a lot.

Developer **Realtime Worlds**
Publisher **Microsoft**
Website **crackdownoncrime.com**

Players **1-2, co-op**
Other platforms **None**

VERDICT

Superhuman feats; free roaming environment; great action scenes.

Not very challenging; finished in an afternoon; not particularly innovative.

SCORE **8.0** OUT OF 10

CULTURESHOCK

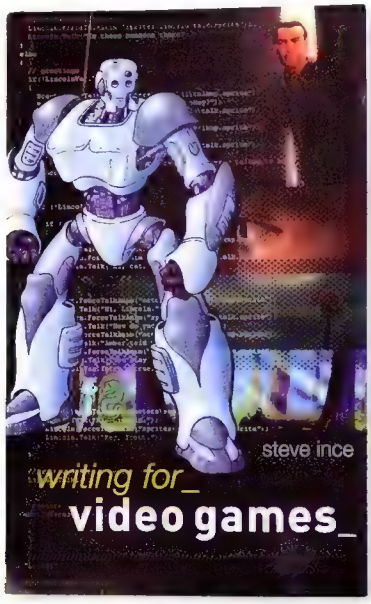
Everything you need to know about geek film, music and literature

Writing for Video Games

BOOK Distributor Allen & Unwin Web www.allenandunwin.com Author Steve Ince Price $39.95

Author Steve Ince's claim to game writing fame was Revolution's Beneath a Steel Sky. It harks back to a day when the adventure genre was still in its prime, and story was a crucial element to a successful game. These days, as Ince himself points out in *Writing for Video Games*, a game can get along just fine, and even be a massively profitable endeavour, with a main protagonist that doesn't utter a single word.

So what place does a writer have in an industry where the value of a good story has diminished so significantly? Ince attempts to answer this question with his vast amount of practical knowledge.



The book assumes the reader is a qualified or at least semi-talented writer with an eye for getting a job in the gaming industry, and not the other way round. As such it goes into detail early on, explaining the different genres, including shooters and MMOs, and their creative requirements. There's also a treatise on the gaming industry itself, and is enlightening even for the seasoned player.

A large focus of the book is the internal machinations of game production, and the demands it places on a writer. For example, a basic shooter may only require a few weeks of work on the writer's behalf for the basic story, while a full-blown RPG could have the writer coming back time and again to rewrite dialogue to match the flow of the game.

▲ **Beneath a Steel Sky was penned by the author, so he knows his stuff.**

Ince throughout the book emphasises the use of interactive fiction and we get the impression this is his preference. He even goes as far as to say Half-Life 2 is not the best example of good story exposition, as the player neither takes part in dialogue, or is required to pay attention to it, lessening its importance.

More proof of the book's aim at the less gaming-educated audience comes with the description of scripting systems, such as those used in Neverwinter Nights and SCUMM. Ince provides a simplistic guide to these sorts of systems, however we wouldn't call it a dependable resource. Most games use their own, custom scripting system and while *Writing for Video Games* deals with the essentials it won't prepare the hardcore writer for the intricacies of individual engines. Not that it could, but this is something that should be kept in mind if you're looking to read further, or decide to memorise the syntax of the example script at the back of the book.

Towards the end, Ince talks about getting into the industry, marketing your skills, and the legalities of intellectual property. This is definitely an insightful section and it's good to see Ince has covered what might have easily been an overlooked or neglected topic.

Overall, *Writing for Video Games* is a solid introduction for a writer to the world of game design. While gamers won't gain a great deal from the first half of the book, those without a technical or management bent will reap rewards as they progress to the middle and end of the book. There's also an index, which is always handy. **LB**

ANIME OF THE MONTH

Your regular dose of anime goodness courtesy of our resident expert Amina Soemino.

Ergo Proxy

Studio **Manglobe** Distributor **Madman** Web **www.madman.com.au** Price **$29.95**

Two parts Aeon Flux, one part Isaac Asimov and one part something completely new, *Ergo Proxy* is one anime you have to check out if you're even remotely a fan of the thinking-person's sci-fi.

Set in a dystopian society where a single city exists in a world ravaged by ecological disaster, 'immigrants' must work to earn their place as 'citizens'. The city is tightly regulated, and the human populace is served by non-sentient robots called AutoReivs.

Crafted by Dai Sato, also behind much of *Ghost in the Shell: Stand Alone Complex* and *S.A.C. 2nd GIG*, *Ergo Proxy* revolves around the character Re-l Mayer, an

Last Train to Freo

DVD Distributor The AV Channel Director Jeremy Sims
Starring Tom Budge, Steve Le Marquand

***Last Train to Freo* could have been great. And the start is. The** premise – simple as it may be – is interesting, telling of two rather thuggish men who board the last train of the day from Perth to Fremantle with the hope of livening up the journey a little for their fellow passengers.

As the train travels onwards, the two alternately entertain and terrorise the others in the carriage. But then, at about the halfway point, things start to fall apart. A plot emerges where it really isn't needed – and to top it all off, it's hideously melodramatic. As the conclusion draws near, things get more and more ridiculous, the storyline ending up feeling contrived and far too reliant on coincidence. That's not to say *The Last Train* should be avoided altogether, though. The first act is brilliant. It's smart, funny, scary, sweet and honest – everything a good film should be. It absolutely nails the way people attempt to avoid contact with strangers at all costs.

What really impressed us is director Jeremy Sims' use of the carriage – how far the characters sit from each other, how they move about, the way Tom Budge uses handrails as monkey bars, the classical music playing from the PA system. Unless you're really into Australian cinema, this one probably isn't worth a purchase. But by all means hire it – just realise that its brilliance will peter out long before the train reaches Fremantle. CT

Score 6.5 OUT OF 10

Eko Eko Azarak: The Dark Angel Trilogy

DVD Distributor Madman Director Shimazaki Satoru
Starring Kimika Yoshino

Let's get one thing clear – the *Dark Angel* trilogy is quite possibly the worst thing produced by the film industry in the history of ever. Really, it makes *The Mummy Returns* look good. The trilogy is about a young lass who goes by the name of Misa. Misa likes to do funky magical shit while wearing schoolgirl getup. She doesn't like talking and she certainly doesn't like boys, she has been known to partake in a wee bit of panty flashing… which brings us to the heart and soul of these films. Put it this way. Within 15 minutes of watching the first instalment, *Wizard of Darkness*, we get to see an old man molesting a schoolgirl, a woman's brain splattered all over the pavement and an obscene amount of underwear. And how can we forget the ridiculous changing room sequence.

Let's not be too harsh, though. *Birth of the Wizard* and *Misa the Dark Angel* – parts two and three respectively – do at least make an effort to tone down the gratuitous nipple-sucking close-ups and voyeuristic absurdities of the original. And really, you'd be able to take them as serious attempts at being decent if it weren't for the zombies that looked and acted like the bad guys in *Power Rangers* or the wizard who appears to be a younger version of *Iron Chef*'s Chairman Kaga.

Trash can be fun in limited does – indeed, part one is entertaining in its own way – but by the third outing, *Angel* manages to wear out its welcome. CT

Score 2.5 OUT OF 10

inspector working for the Citizen Intelligence Bureau. When Re-l, along with her AutoReiv companion Iggy, begin investigating a series of murders and the spread of an AutoReiv virus called Cogito (infected robots gain sentience), Re-l inadvertently unravels a plot involving disturbing AutoReiv and human experimentation.

The animation is first rate, combining traditional cel with 3D. It's more realistic than traditional anime, but this only adds to the tone of the show.

If you can manage to ignore the disturbing fact that Re-l shares an uncanny likeness to Evanescence front-woman Amy Lee, you'll find *Ergo Proxy* a satisfying watch, even if it's less morally demanding than Dai Sato's work on *Ghost in the Shell*.

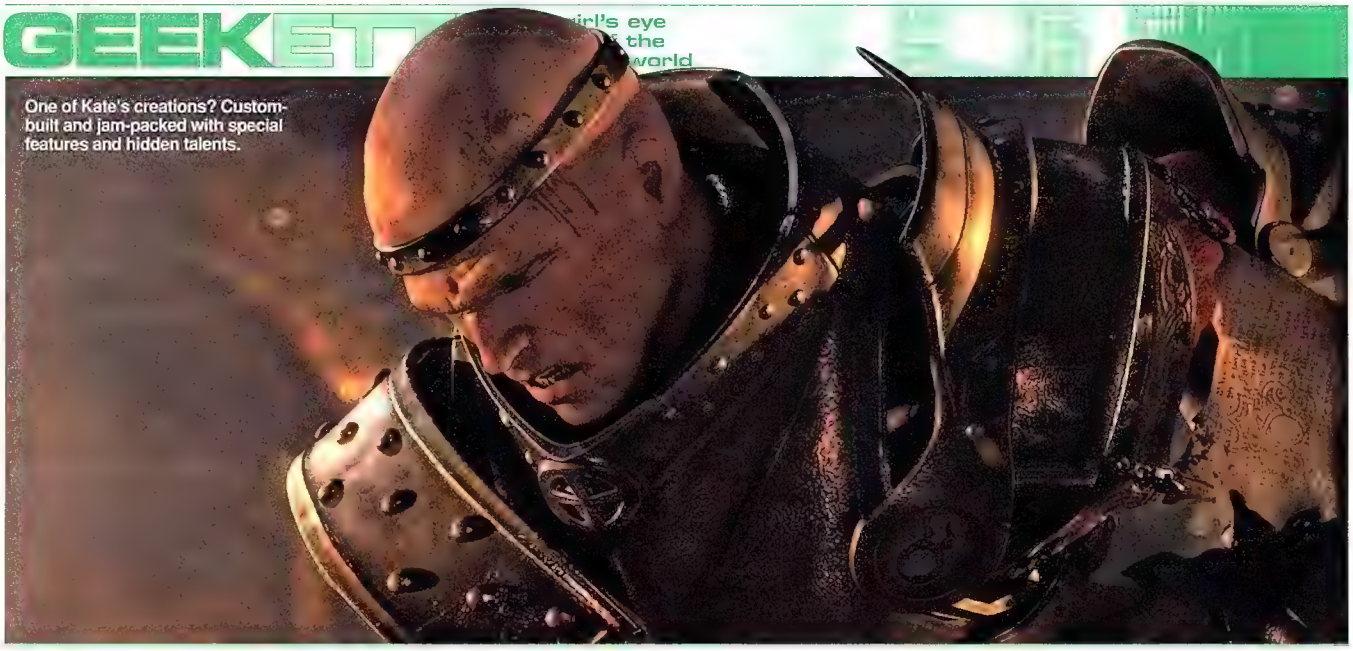
Score 9.0 OUT OF 10

Win Ergo Proxy V1!

5 copies to give away, thanks to Madman!

Chilling, deep and incredibly sexy. Just a few words to describe *Ergo Proxy*, a new anime from *Stand Alone Complex* writer Dai Sato. For your chance to win a copy of the first volume, just visit **www.atomicmpc.com.au/competitions**, click the *Ergo Proxy* link and answer a question!

GEEKETTE girl's eye the world



One of Kate's creations? Custom-built and jam-packed with special features and hidden talents.

Choose your own adventurer

Kate Inabinet wants to have Will Wright's babies.

It has been some time since I have truly got the wind up my skirt about a new game. My hopes were buoyed briefly by the media hype surrounding Viva Piñata only to have the release and subsequent gameplay see them dashed across the lawn like so many boiled sweets. The dusky, Playboy Mansion-esque orange lighting in Oblivion did little to arouse me, and peering over the shoulder of the well-crafted Gears of War should have been more exciting than a head full of screeching bat-insect-type things, but action shooters still fail to do it for me, no matter how fancy.

The imminent Warhammer Online I find immensely appealing, although I admit it has more to do with characters that look like World of Warcraft shrinkies than with the proven potential the tabletop strategy game offers, and Burning Crusade, although one of the best looking expansions to date, had me rolling over and yawning at the thought of time spent building up another character to non-gank status. Yet, despite all my lofty derision, there is one game that absolutely has my primordial juices flowing, and that is the evolutionary sim Spore.

Perhaps it is a throwback to my childhood dress-up days, or worryingly, it may well be an attempt to drown out the bothersome tick-tocking of my biological clock, but I totally get off on creating new characters. In World of Warcraft I had more characters than there are Plainstriders in The Crossroads. One realm was simply not enough, and my progeny soon spanned so many that I had no chance of remembering where to find any one individual. I pre-ordered my Guild Wars: Nightfall expansion in order to gain the extra character slot, as eight was absolutely not enough, and I frequently delete the ninth character just so I can make a new one again. I love nothing more than whiling away the hours choosing skin colour, hairstyle, height, class and name, and I fawn madly over my shiny new Lilliputian creations to the point of creepy obsession.

With the advent of Spore comes a game custom built for my own special brand of freakishness. A game not unlike actual sea monkeys where you 'grow' your character from a microscopic single cell organism, to a fully functioning, intelligent and interactive being – complete with delusions of grandeur and Napoleon-like notions of taking over the world.

Each stage of the game allows you to adjust your character's functional traits as you witness it mature and adapt to its surroundings, which in turn affects its appearance – my personal idea of heaven. Similarly, the way you play determines the personality development of your character, influencing its behaviour – whether they are vain raw foodist 'Arteests' or more along the lines of the dingo-shaped baby devouring 'TwassntMees'.

> "I fawn madly over my shiny new Lilliputian creations to the point of creepy obsession."

I'm looking forward to creating a 'Bulimian' that has a mouth at both ends or a 'Seehowyoolikeit' where the female has a rounded appendage on her body that gently pokes the male in the small of the back all night while he tries to sleep.

There will be no stopping me from orchestrating a whole race of beings with scissors for feet that terrorise their mothers simply by running and another creature that looks like a human from WoW and thus bears no resemblance to any known living entity… weird.

I'll teach them how to survive predators by providing them with the naturally repellent Lara Flynn Boyle trout pout, or if you prefer, encourage their predatory instincts and set about creating a race of slimy 'ShaneWarnions'.

The possibilities are endless and you can go to town with all your Frankensteinian notions to create the perfect creature, then squirm in delight and barely constrained horror as your little darlings leave the nest, herd together, find a mate and reproduce. Soon you will have hundreds of your superior little critters teaming about the planet without taking up an extra character slot.

I can't wait.

Tick-tock, beat the clock. Hurry up and email Kate now, or forever hold your peace.
geekette@atomicmpc.com.au

DEATH TRANCE

EASTERN EYE
ASIAN CINEMA

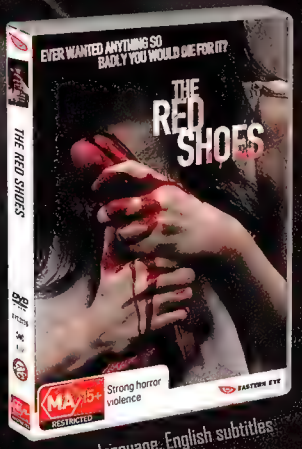
Japanese language, English subtitles

Crazy villains, cool weapons a feast of fighting in a non stop action groove!

HIS ONLY DESIRE IS DESTRUCTION!

THE RED SHOES

EVER WANTED ANYTHING SO BADLY YOU WOULD DIE FOR IT?



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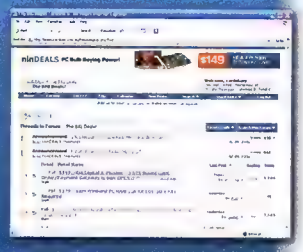

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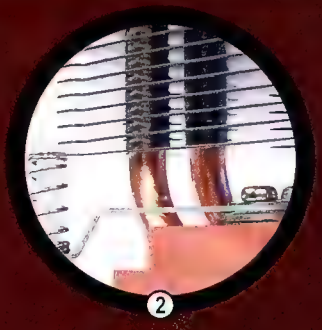

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TECHNIQUE

HANDS-ON TUTORIALS FOR THE TECHNICALLY INCLINED

Variety is the spice of life, not salt, as some would have you believe. With this in mind we've blended both software and hardware into this month's tutorials section.

If you turn the page, you'll find out how to mod a suitcase to make it a dandy container of computer parts and if you turn over a few more pages, Leigh Dyer has all you need to know to get your favourite Linux apps running on Mac.

See, it's the best of both worlds!

TECHNIQUE CONTENTS

Build a PC in a suitcase, Part 1 86
Ron Prouse takes an ordinary suitcase and turns it into a computer. One you can carry around, show your friends and take over the world with.

Run Linux apps on Mac 90
We've been talking about Macs a lot lately, and we're going to keep talking about them. This month, Leigh Dyer talks about how you can get Linux apps to run on Mac. Superb.

Input Output 94
Dan Rutter just wants to see your PC. He won't touch it in its special place, unless you want him to. Honest.

Hotbox 96
A magic case mod for you to see, read and drool over. If you think you've got a hot box, see this page for info on how to get yours in.

Fallout 98
Logan Booker has gone completely insane. He's not medicated either.

Have an idea for an *Atomic* tutorial?

Then send an email to lbooker@atomicmpc.com.au!

When it comes to tutorials, *Atomic* likes to tackle the hard stuff. If it's not hard enough, we just don't do it. Alright – that's not necessarily true, because every once in a while, we like to cover the easy tutorials too. Not so much easy as basic, you know... building the skills, the foundations you need so you can have a go at those tricky tutorials.

We know that techniques change, as does technology, and guides that might have been useful a few years ago can be close to useless today. So, if you have an idea for a basic tutorial, like soldering, water-cooling or harpooning whales even, let us know.

Now go email!

DIFFICULTY INTERMEDIATE

Build your own PC in a suitcase, part 1

Ron Prouse guides us to portable PC heaven.

SUPPLIES

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1x Aerocool Streamliner 140mm Fan, $29.95
1x 450W Cogen PSU, $59
1x Silver AC Ryan MeshX Panel, $27.50

Jaycar Electronics www.jaycar.com.au
2x momentary switches (Cat# SP0775), $4.95 each
2x 3mm blue LED bezels (Cat# SL2617), $2.95 each

Over the last few years we have become somewhat numb to the bizarre places that people have chosen to insert hardware into, including the 'Gingerbread PC', 'Toilet PC', 'Microwave PC' and even some strange female creations that reflect manga culture at its most creative. One of the perennial favourites that keeps cropping up is the suitcase or toolbox PC. This is one mod that is sensible, given that the rugged and portable nature of the enclosure makes it a natural choice for a LAN box or server. That said, the suitcase PC has been done in many alternative ways, from completely stealthed styles that give no indication of what lies within, right through to enclosures that include windows and lighting. We chose the middle ground – leaving intact as much of the original briefcase as possible, but also including blowholes, exposed power connectors and switchgear, external optical drive and a full backplane. This means that the lid of the suitcase will not have to be opened for the PC to function normally.

1 Finding a suitably-sized suitcase is not hard, however finding one that is affordable is another issue. We had a mental image of the type of case that we would use for this tutorial – something sleek, sexy and James Bond-ish in brushed aluminium – until we discovered that such an item will set you back almost twice as much as a Lian Li PC-60! There is little point in a tutorial that's out of the reach of most budgets, so we had to find another way.

The contingency position involved a trip to Bunnings Hardware, where this aluminium toolbox was an apparent bargain at $26.

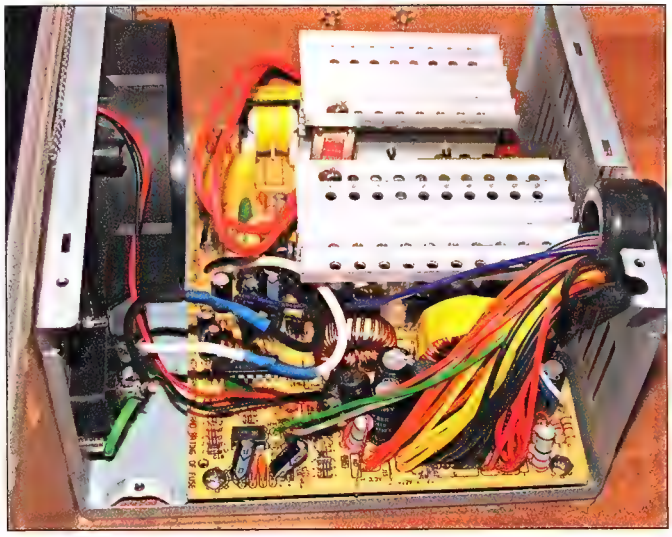
2 We say 'apparent bargain' as, once we got it out of the shrink-wrap, there was both good and bad news. The good news was that the interior was large enough and deep enough for our hardware, the bad news being that the 'aluminium' was just a plastic film wrapped over a composite wooden bodywork. Imagine really dense MDF-like cardboard. A flip of a coin dictated that we would go ahead with the project as planned, with the philosophical attitude that this is just the type of challenge that an Atomican would revel in. The positive aspect to the wooden construction is that it is not electrically conductive.

After tearing out

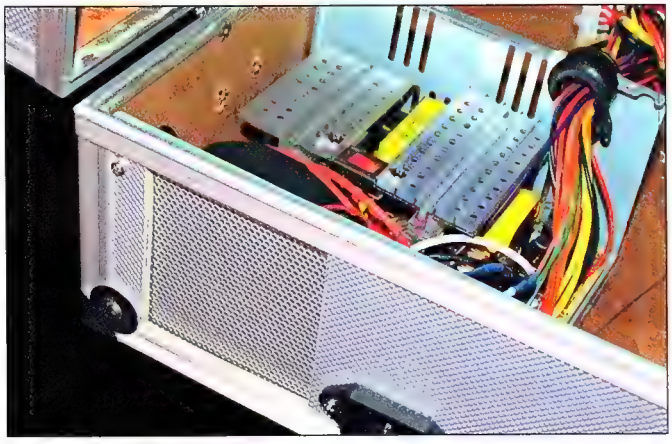
the padding and faux suede interior, we could see exactly what we were working with – it just didn't get any better. The 5mm thick sides and bottom were not overly sturdy, and the aluminium 'framework' was held together with glue and a few bifurcated rivets. On the upside, any of the components that are attached will actually add to the overall strength of the enclosure.

3 As per usual, the first step was to put a plan together. The concept was to create a case that could be used to house hardware from any level of the performance spectrum, however that dictated that certain components and dimensions were critical – such as a full-size power supply (PSU), and enough room for expansion cards. Initially we considered using water-cooling, however the tight fit and additional weight made this a less portable solution. A larger suitcase with sturdier construction would have made all the difference, but this time air-cooling wins.

After arranging the components into a suitable floor-plan, the 450W PSU was prepared for installation. We wanted the PSU to fit hard up against the inside of the case, so all of its external protrusions had to be shaved off – the mains pass-through connector was removed and the voltage selector switch was relocated to the top of the heatsink. The power socket wires were extended so that the socket could be mounted to the outside of the case, and the pressed fan grille removed to allow better airflow. The PSU circuit board was temporarily removed, so that the lower section of the PSU shell could be screwed to the bottom of the briefcase. The PSU was then reassembled for the final time.

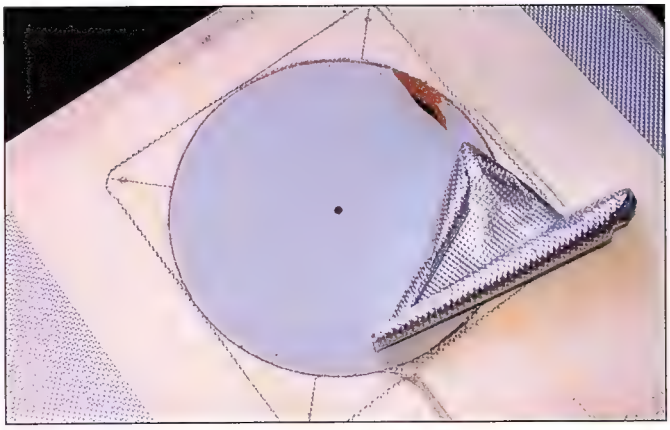


4 The next step was to cut the holes in the side of the briefcase for the PSU exhaust fan and power connector. It soon became obvious that the main issue in working with this 'veneered' type of construction was to avoid the plastic film from peeling off the timber as it is being cut and sanded – which is explained more fully in the next step. To give the finished blowhole a more stealthed appearance, an L-shaped silver AC Ryan MeshX grill was fabricated and sandwiched between the PSU and the case inner. The wooden lip around the blowhole will be painted with flat aluminium paint once all of the holes have been cut and finished. With the PSU top/side cover replaced, it was attached to the rear of the briefcase with two pop-rivets, adding further structural strength.



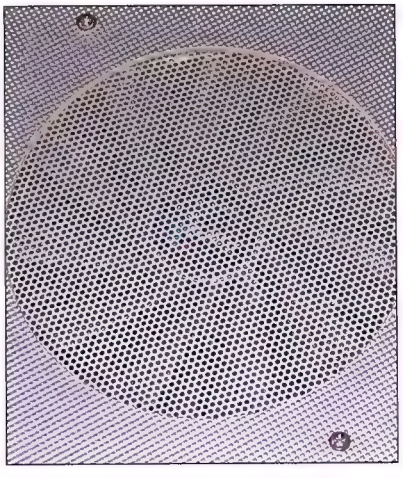
5 Seeing as a suitcase is obviously designed without regard for cooling a PC, the next step is to create some airflow. We decided to use a 140mm Aerocool Streamliner Fan for the case air intake, working on the theory that you can't go wrong with a bloody great big fan that pushes a whopping 54.7 cubic feet of air per minute, especially at a barely audible sub-20dBA noise level.

In the previous step we mentioned that the veneer finish of the briefcase caused some problems during cutting, as the plastic 'aluminium' film would easily peel away from the timber. The answer was to scribe the circle (or line) to be cut, and then carefully cut through the film around the circumference with a scalpel. The film was then removed, and a jigsaw used to cut the timber up to 1mm inside the perimeter of the hole. Fine-grade emery paper was used to finish the cut and chamfer off the film around the edge of the opening.



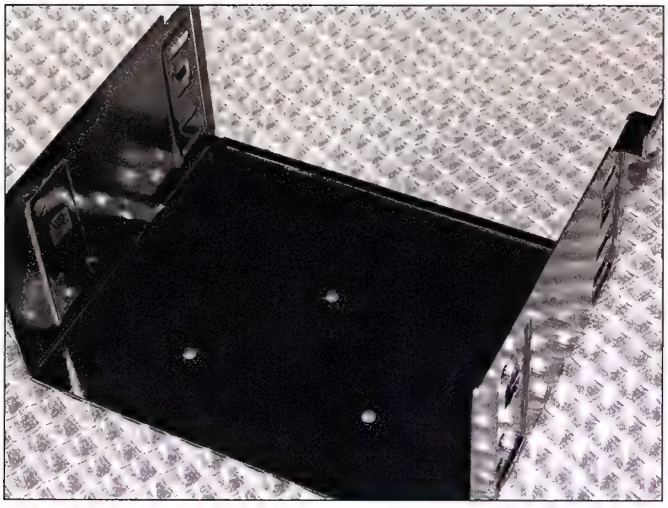
6 The fan was placed in the lid of the briefcase, directly above the CPU area of the motherboard. The main thing to be aware of is the amount of headroom available – especially above the graphics card and PCI slots. For example, in this instance the inside height of the case is 142mm (95mm body, 47mm lid), and the average graphics card needs 125mm of height above the motherboard. That leaves 17mm of headroom, which is not enough space for a normal case fan – and then the lid won't shut. The same situation can arise over the CPU, depending on the type of heat-sink being used. If this becomes a problem, a good workaround solution is a 2U server HSF.

The top blow-hole was also given the stealth treatment with an AC Ryan MeshX grill, which was cut to the same size as the fan and secured by the fan screws. As with the PSU blowhole, the wooden lip around the top fan will be finished later with flat aluminium paint. After checking the airflow through the case we decided that a planned second exhaust was unnecessary, as the PSU exhaust fan was moving enough air to keep things cool.



7 The next cut-out was for the optical drive, which was placed at the front LHS next to the PSU. The area has been covered with masking tape to protect it from damage while being cut with a jigsaw. The upper edge of the drive bezel was placed directly against the extruded aluminium support, which runs around the top and bottom of the case opening, an area that is less likely to flex and warp when weakened by the cut. Once the drive has been secured into place, with brackets bolted to the case bottom and front, it will also add strength to that section of the case.

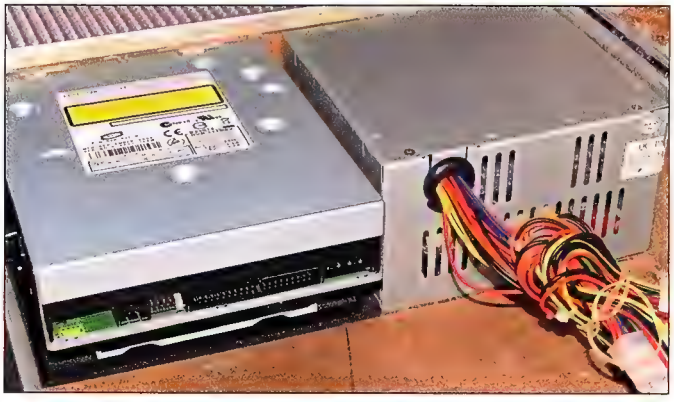
8 The next step is to start assembling the brackets for the peripherals, and the best place to start is the junk pile of cases at your local computer recycler. No, this isn't really cheating, it is simply working smarter! Of course it is a fairly straightforward process to bend up sheet metal from scratch, but for the sake of simplicity there is no point reinventing the wheel. The ODD drive 'cage' was fabricated from a section of an old micro-ATX case, although none of the original drive mounting points or supports have been used. Three holes were drilled to mount the bracket to the floor of the briefcase, and the dog-leg bracket on the right will be used to secure it to the front panel. A coat of high gloss black completes the makeover.



9 A 2.5" laptop hard drive was chosen for the project for two reasons: firstly, it would save on room; and secondly, as it was originally designed for portable use, it is engineered to take some additional knocks and heat. For ease of installation, we fabricated a slide-out tray for the HDD, using the case from an old CD-RW drive,

cut down and shaped for the purpose. The HDD was mounted to the tray on motherboard risers fitted with siliceous washers, to aid in cooling and to help minimise vibration. If a 3.5" HDD was used, a wise addition would be an internal 80mm fan in front of the drive cage to circulate air through this area of the case.

10 The ODD was assembled into the cage, which was then installed into the case – do it the other way around and you can't access the screws on the sides of the drive. For some extra protection, self-adhesive high-density foam was attached to all of the contact areas around the cage, and then 4 x 3mm screws were used to secure the brackets to the case bottom and front panel. Finally, the HDD tray can be slid and clipped into position.



With the PSU and drives fitted into their final positions it became apparent that this was going to be a tight fit, indicating why planning can resolve a lot of headaches before you even pick up a power tool.

You may have noticed in the top of the first image in this step that the DVD drive is actually mounted upside down this proves that we all have the potential to make stupid mistakes.

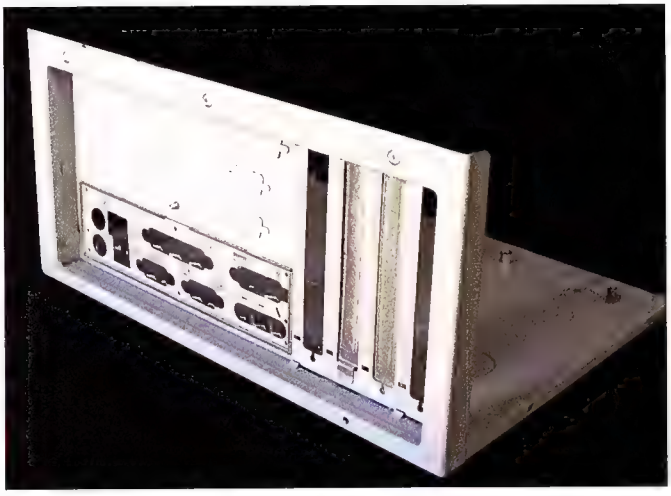
11 The next step was to mount the power and reset switches and activity LEDs. Initially we were going to use boring black momentary switches mounted into the I/O panel, however once we spied these sexy, made-to-measure switches at Jaycar the plan changed instantly. The switches (Jaycar catalogue number SP0775) were fitted to the rear panel of the case, and an 'O' lightly engraved onto the on-switch to save confusion later!

The power and HDD activity LEDs were fitted to the front RHS of the case, using 3mm 2V blue LEDs in chrome bezels (Jaycar catalogue number SL2617), which will happily run off the motherboard headers without using resistors.

12 Externally, to anything other than a cursory glance, it is apparent that the suitcase has been modified, however, it is one of those things that only becomes really obvious on a second look. Once the backplane has been grafted into the RHS it will lose all of its anonymity

from that angle, however the image of having all of the connectivity through a bunch of cables running out through a raised lid just doesn't appeal to our sense of aesthetics. We want it too look like a factory finish.

13 So, it was time to get the I/O panel sorted. As mentioned in Step 8, sometimes the best outcome is achieved if you cheat a little, and in this instance we cheated a lot. The hardest case section to fabricate would have to be the expansion bay (second only to the I/O plate retainer), and getting it wrong will affect both the aesthetics and functionality of the mod. Having decided to cannibalise an existing case, the next question was: How?



The most common mistake made when undertaking major steel surgery is the choice of weapon. Tin-snips will twist the metal as they cut, and a jigsaw will often distort the project through vibration – especially around the more delicate 'skeletal' sections. A Dremel will work fine, as long as you have several hours of spare time and a bucket full of cut-off discs. In the end the answer was to get far more industrial. Using a 100mm grinder and 1mm cutting blade, a suitable backplane and motherboard tray was surgically dissected from an old micro ATX case using the 'hot knife through butter' cutting ability of the grinder to leave its integrity completely intact. Just be cautious of a grinder's 'hot knife through fingers' capability, too, because that one hurts.

This section will be grafted into the right hand side of the suitcase, replacing most of that side's body and lid. The panel was cut so that there was plenty of opportunity to 'screw and glue' the two components securely together, especially across the floor where the mobo is situated, with the focus again being to add more structural rigidity to the case.

Next month, Part 2 of this tutorial will cover off the final body work, installation and wiring tasks.

DIFFICULTY INTERMEDIATE

Run Linux apps on Macs

Leigh Dyer shows you how to get all your favourite Linux apps to run in Mac OS X.

Though the shiny user interface does a great job of hiding it from the world, Mac OS X is built on a solid UNIX base, and that opens it to a world of applications typically only seen on Linux and UNIX systems. There's a vast array of open source software on tap that, with the right tools, can be compiled and run on Mac OS X systems. Building software isn't always easy though, and keeping track of it once it's installed is even harder – to retain your sanity, you need a package management system like MacPorts.

MacPorts is an implementation of a lightweight package management system. Rather than containing the software itself in a ready-to-install form, MacPorts contains descriptions of the available software packages and instructions on how to build them from their source code. When you install a package, MacPorts downloads the source code, runs the appropriate build commands, and installs the results, all with just a single command. If you later decide to uninstall a package, you can do that with a single command as well.

One of the most powerful aspects of MacPorts is the way it tracks dependencies. For instance, everyone's favourite open source image editor, The GIMP, needs the GTK 2.0 GUI library to run. MacPorts knows this, and if you try to install The GIMP, it will automatically install GTK if it's not already on the system.

Installing software from source can take a while, though it does have some advantages. For starters, it renders the whole Intel/PowerPC issue moot – everything you install through MacPorts is automatically built for the CPU in your system. It also allows for quite a bit of customisation, as we'll see later on.

Prerequisites before installing MacPorts

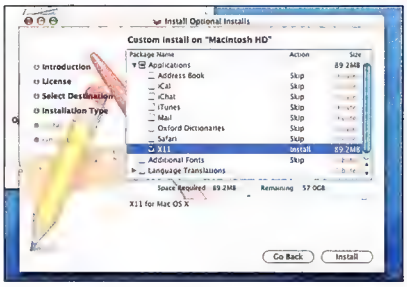
Before installing MacPorts, you need to install a compiler to convert source code into binaries, and X11, the GUI system used on virtually all Linux and UNIX systems. The following steps will get everything you need in place. Insert your Mac OS X 10.4 DVD and run the 'Optional Installs' installer.

1 Under Applications, select 'X11', and hit Install.

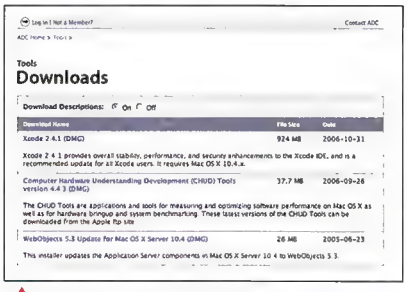
2 Download the XCode software development toolkit from Apple's developer site, at **developer.apple.com/tools/download**. You'll need a free account to complete the download – you can register for one on the spot or use an existing Apple ID. At over 900MB, it's unfortunately not the smallest of downloads.

3 Open the XCode disk image and run the installer. When installing, hit the 'Customise' button at the bottom of the installer window and enable the 'X11 SDK' package under 'Software Development Kits' – this contains the developer files needed for building X11 applications.

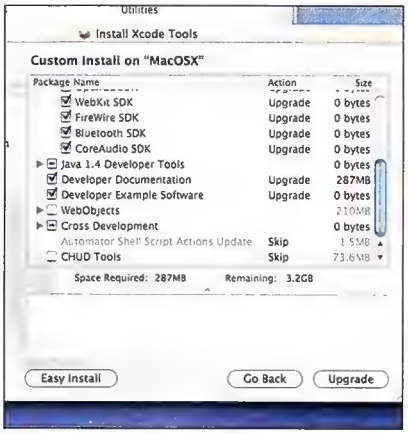
4 Go to the MacPorts download site (**svn.macosforge.org/repository/macports/downloads**) and download the latest .dmg version. At time of writing, this was actually DarwinPorts 1.3.2 – DarwinPorts is the project's former name. Open the MacPorts (or DarwinPorts) .dmg file and run through the installer contained within.



▲ **Apple's X11 is right there on your Tiger DVD.**

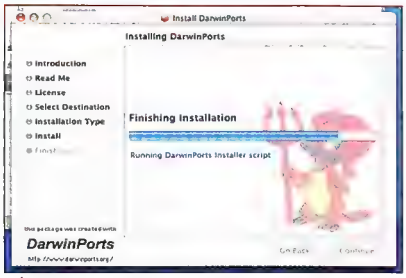


▲ **XCode and other developer tools are free to download and use.**



▲ **Make sure you install the X11 SDK in XCode.**

5 Now that MacPorts is installed, we can start to play. Out of the box, the only option for interacting with MacPorts is on the command line, using the 'port' tool. Open Terminal.app from Applications/Utilities, or any other terminal emulator – iTerm (**iterm.sf.net**) is a great free alternative. Before doing anything else, run the following command, and enter your password when prompted:



▲ **The platypus devil guy, Hexley, is a play on the classic BSD 'daemon' mascot.**

```
sudo port selfupgrade
```

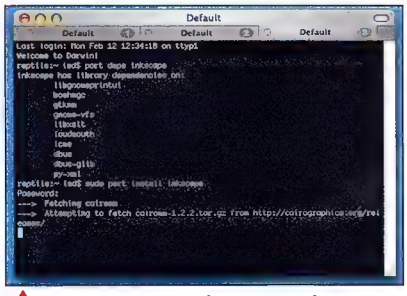
This will install any updates to MacPorts itself, as well grab the latest list of installable packages from the MacPorts site. Run this every week or so to keep things up to date.

Installing new packages

Installing new software really is as simple as a single command, like this one, to install the latest version of The GIMP:

```
sudo port install gimp2
```

To install other packages, simply change the name of the package. To find packages, you can use the 'search' command to list packages with names that contain the specified string. For instance, if you want to do some Web development on your Mac, you could search for PHP and related packages:



▲ **The magic 'port' command handles all your installing needs.**

```
port search php
```

Once you've found a package, you can get more information on it using the 'info' command:

```
port info php5
```

If you do install The GIMP, it'll take a while – building software itself can take time, and its dependencies will add to that as well. You can get a list of the dependencies with the 'deps' command:

```
port deps gimp2
```

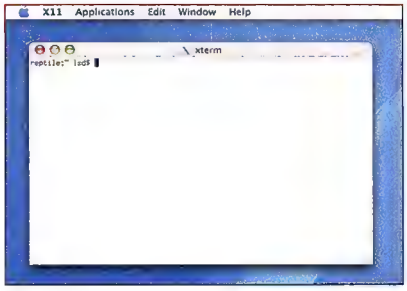
Finally, to uninstall a package, use the 'uninstall' command. If any other packages depend on the package you're trying to uninstall, you'll be presented with a list of them – you won't be able to complete the uninstall until they've been removed as well:

```
sudo port uninstall gimp2
```

Launching your new apps

The simplest way to launch most of the new programs you've installed is to simply run them from the command line. If they're programs that have just a command-line interface, you shouldn't have to do anything special. When MacPorts is installed, it adds a special '.profile' file – or modifies it if it already exists – to your home directory that adds the MacPorts binary folder, typically /opt/local/bin, to your path.

For GUI programs that use X11, you first need to launch X11.app, which should be in your Applications or Utilities folder. On a Linux system, X11, or X as it's usually abbreviated, runs the entire GUI. Apple's X server, though, runs by default in a 'rootless' mode, which means that X doesn't have its own desktop and background. Instead, X apps open on the standard desktop, with their windows sitting happily alongside standard Mac apps.



▲ **X11 and xterm - it all looks terribly plain by default.**

When you launch X11.app, you should see a rather plain-looking terminal window – this is 'xterm', the standard X terminal emulator. You can launch your X-based apps from this terminal, but because of the way X is launched, the binary folder options added to your .profile file by MacPorts aren't read in by xterm, so you need to specify the full path to the program you want to run. For instance, if you installed 'rdesktop', the handy Remote Desktop client for connecting to Windows servers, you could run it like this:

▲ **Launching apps using the full path gets really old, really fast.**

```
/opt/local/bin/rdesktop mywindowsbox
```

Of course, from Terminal.app you can run rdesktop directly, but the terminal session there lacks the information needed to find your running X server. Thankfully, you can fix both of these problems with a couple of quick file edits:

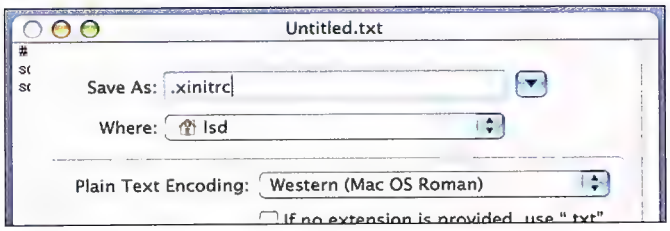
1 Open your .profile file in your favourite text editor. If you have some UNIX familiarity, you could use the 'vi' command, but a nicer option is to use TextEdit through the very neat 'open' command. It's a very handy one indeed:

```
open -a TextEdit .profile
```

Add the following line at the bottom, and save the file. This will enable you to run X apps from any terminal, as long as X is running.

```
export DISPLAY=:0.0
```

2 Create a new text file in your home directory, called '.xinitrc' with no .txt extension, and enter the following lines. This will read your MacPorts path settings into X sessions:



▲ **Make sure you name your '.xinitrc' file properly.**

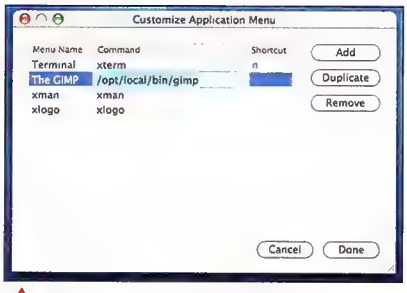
```
#!/bin/sh
source ~/.profile
source /etc/X11/xinit/xinitrc
```

3 Mark the .xinitrc file you created as executable, so that X11 can run it at startup:

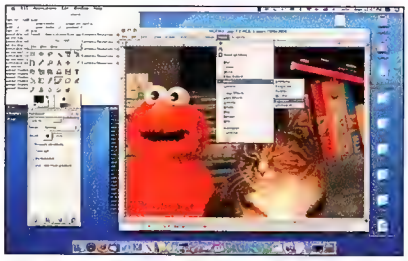
```
chmod +x .xinitrc
```

Now, if you shut down Terminal.app and re-launch it, you should be able to run all your X apps without a problem. Similarly, if you shut down and restart X11.app, xterm should be able to launch your MacPorts apps without needing the full path.

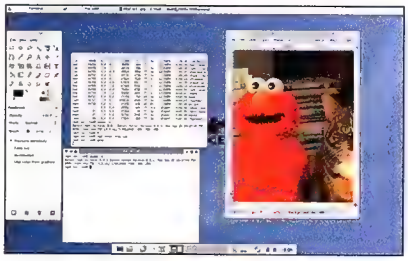
If launching terminals just to launch real applications doesn't float your boat, you can use the Applications menu that's built into X11.app. This menu is available both from X11.app's menu bar, and from its dock icon if you click and hold (or right-click) on it. To add a new application, select the 'Customise' option from the menu, click the 'Add' button, and enter the name of the app, and the command to run, to launch it. It's best to use the full paths to commands added here, just to make sure X can find them.



Add your own apps to X11's Applications menu.



The GIMP is a great example of the kind of apps MacPorts can install for you.



If you really want to, you can install complete desktop environments.

Upgrading packages

MacPorts makes upgrading packages when new versions come along quite straightforward. To get a list of any packages in need of an upgrade, run 'port outdated'. You can then upgrade specific packages using the 'upgrade' command:

```
sudo port upgrade gimp2
```

You can also add a '-R' flag to the 'upgrade' command to automatically update any outdated dependencies. If you have some spare CPU cycles ready to burn, you can upgrade all of your outdated packages with a single command:

```
sudo port upgrade outdated
```

Variants

Building from source opens lots of customisation options, because you can enable and disable options to match your requirements. For instance, if you're installing PHP, you get to choose which Web server you build it against (even if that's usually just a choice between Apache 1.3 and Apache 2), there are all sorts of optional modules that you can enable or disable.

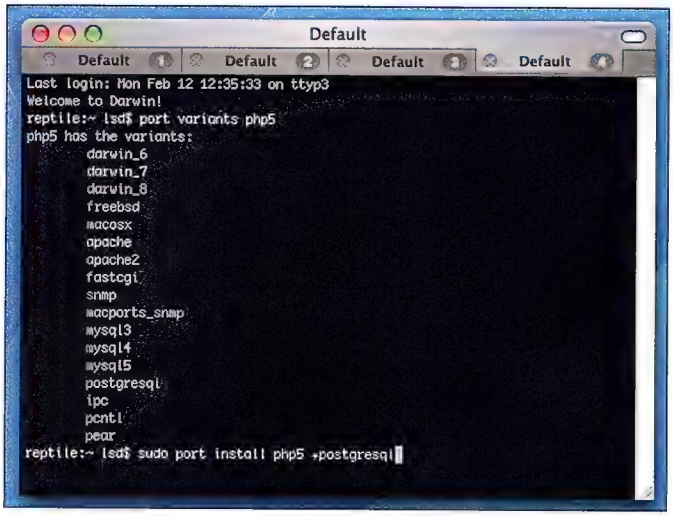
Rather than forcing you to manually tweak your build options, MacPorts has its 'variants' system, which allows an individual port to specify discrete options that can be enabled or disabled to suit your needs. To list the variants available for a package, use the 'variants' command:

```
port variants php5
```

To enable a variant when installing a package, add it to the end of the 'port install' command, but with a '+' in front. For example, you could install PHP5 with PostgreSQL support:

```
sudo port install php5 +postgresql
```

If you've used Gentoo Linux and its ports-like 'portage' system, variants will seem quite similar to USE variables – variants are a bit more limited, but the idea is basically the same. In fact, you can even specify a set of default variants, which are applied automatically to all new installations, similar to system-wide USE variable configuration on Gentoo. To do this, open the '/opt/local/etc/ports/variants.conf' file in a text editor and add the desired options.



Variants allow you to customise the options enabled in your packages.

THE FINK, ERM... FANTHER

MacPorts isn't the only open source package manager for Mac OS X, though we do think it's the most *Atomic* of the lot with its extensive list of software, frequent updates, and its 'variants' system. However, the rapid pace of updates sometimes means that packages can break from time to time, so you may need to do some manual tweaks or avoid specific upgrades from time to time.

The easier alternative is Fink (**www.finkproject.org**), a project that builds on the 'dpkg' and 'apt' package management tools used in Debian and Ubuntu Linux systems. It has two specific features that make it easier to use than MacPorts – a concept of multiple versions of the package list, including 'stable' and 'unstable' branches, and pre-compiled binary versions of most packages on the stable branch. The packages are all well-tested, and having them pre-compiled makes them much quicker to install, but the catch is that the stable branch is usually quite old. You can install packages from the unstable branch, but as with MacPorts, they need to be built from source and they may not work well, if at all.

If you just want to install a few tools with minimal hassle, and don't care that you probably won't have the latest available versions, Fink can be an excellent option. MacPorts is more flexible though, and particularly if you come from a Gentoo background, it's definitely the best option if you don't mind living on the edge.

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Swap begone!

I upgraded to 1GB of RAM. I have WinXP Home and a 1.1GHz Duron. I don't want a swap file, for performance, so I changed my swap file to 0MB in My Computer. And at My computer/Advanced/Performance Settings/ Advanced/Virtual Memory, the total paging file size says zero megabytes.

In Regedit I navigated to HKEY_LOCAL_ MACHINE\SYSTEM\CurrentControlSet\Control\ Session Manager\Memory Management, and changed DisablePagingExecutive to 1.

But in the FreeMeter system monitor, it says I'm using about 300MB of RAM and still about 200MB of page file.

What is happening? Is there another program to confirm the swap file is zero?

Glenn Mitchell

FreeMeter may be telling you about data that Windows wants to swap out, but can't, or something - you can't really disable virtual memory on WinXP, only stop it from working properly.

It doesn't really matter, though, because you shouldn't be doing this in the first place.

It is not generally a good idea to try to run WinXP without a swap file. It's possible, but many programs (not to mention a bunch of default XP services) assume the swap file to be available, and may fail in ugly ways if it's not there.

Often, in particular, a program will request much more memory than it's actually likely to need, assuming that this is no big deal because it'll just get a chunk of swap file allocated to it and only use as much physical memory as it *really* turns out to need. With no swap file, though, every program that asks for 512MB because it might possibly need it if you open 50 documents will *get* its 512MB inviolable slice of your precious physical RAM, and nothing else will be allowed to use it.

Fortunately, generally speaking, the swap file does not actually slow Windows XP (and later) down. Heck, it didn't even really slow Win95/98 down that much. It's not having enough physical RAM that slows Windows down.

Windows can actually run *faster* with a swap file, because it uses it to unload seldom-used components to free up physical RAM that it can then use for something like disk caching. WinXP's virtual memory management is actually quite smart.

With only a gigabyte of memory, you're not going to be able to run many apps at once without a swap file. The OS itself, even with System Restore and so forth turned off to avoid dire where's-the-swap errors, will eat a lot of your RAM.

Swapless XP is more feasible if you have more than 2GB of RAM. It can be handy for specialised setups, like business boxes that boot from flash disks that can't handle a lot of write cycles. Such computers are unlikely to suddenly be used for 3D games and video editing, so a hard ceiling on their memory isn't too dangerous.

For general purpose computing though, swapless XP's still a waste of time.

XP will never be blazing fast on your computer, but it'll run more than fast enough for most purposes if you're not running out of physical RAM. If you are, the only solution is to buy more of the stuff.

If you want to get tricky about it, then you can put your swap file – or your whole Windows install – on a RAM-based device, like a Gigabyte i-RAM card. That can let you wring out a bit more performance. It's goofy to do that with a computer that's worth less than an i-RAM with a couple of gigabytes on it, though, and there's close to no point to doing it at all if you haven't already installed as much RAM on the motherboard as it can take.

I/O OTM wins a Logitech G5!

There's a mouse in the house. Okay, it's not in the house, it's in IO. And it looks damn good.

Wanted: Two dimensional fan

I have an Xbox 360. The heat sink above the GPU is not good enough but it's custom for the case, so I'm looking for a tiny fan I can put on top of the heat sink.

Do you have any suggestions? The gap between the DVD drive and the top of the GPU is only 1/4 inch.

Todd

Unless you feel like running the DVD drive outside the casing, there's not going to be enough room for a conventional 'axial' fan there. There are two DIY options, though.

Step 1: Buy one of these. Step 2: Take your hatchet and carefully cut a hole in your Xbox...

One is to use one or more centrifugal 'blowers' rather than a fan. Most of the companies that make small axial fans make blowers as well. Put the blower(s) at the end of the heat sink where there's a space on top of the circuit board. That'd get you some solid air flow over the heat sink, though cramming even small blowers in there could be a pain.

The other option is to just chop a big hole in the top of the 360's casing and install a large fan there. The standard 360 ventilation is provided by a couple of tiddly 60mm exhaust fans; even a quite low power 120mm fan hacked into the middle of the top panel should deliver considerably more air flow, so you might well be able to just remove the standard fans.

There are plenty of after-market 360 fan products, of course, from bolt-on external fans of various kinds to dual-60mm fan modules that you can swap in place of the stock internal ones. You can't beat the airflow bonus you get from chopping a big old hole in the side of the casing, though. And if you put a dust filter over the new intake fan and remember to clean it, your 360 shouldn't turn into one giant fuzz bunny, either.

Positive, negative, cognitive, laxative...

I'm building a bench power supply from a kit and have hit a snag with the main filter capacitors. The two caps each have three legs, all different lengths, which is a problem because I don't want to blindly solder the third leg to either the + or -.

Googling gives me nothing useful, and it doesn't help when the brand of capacitor doesn't get one hit in Google.

The power supply kit in question is a Dick Smith K3206. I did some resistance measuring with my multimeter between the legs and got:

- From the middle to the minus, or the middle to the plus, it goes up to 40 megaohms, which is the limit of my meter.
- From the positive to the negative it goes up to 3.9 megaohms, and seems to keep going up slowly.

Any help would be appreciated!

Komodo

The middle terminal appears to be connected to nothing because... it is. It's a dummy lead that's there only to stabilise the cap.

This design is fairly common for large electrolytics – the third lead is soldered to an unconnected pad on the circuit board, and that gives the big cap a firm tripod mounting that stops it from wiggling around.

If there's no PCB hole for the third lead, you can just snip it off.

Genuine 'three terminal capacitors' do actually exist. They're not weird magic devices, though; they're usually two caps in one casing, or some other hybrid device.

Finally, the reason you're seeing that slowly increasing resistance reading between the plus and minus leads, is because the small current from your multimeter is charging the cap.

I/O OF THE MONTH

Interference over Ethernet?

I just read the article on Ethernet over Power and Power over Ethernet in *Atomic issue 71*, and it reminded me of something I've wondered about for a long time.

As a trainee technician that works in a lot of corporate environments where there are a lot of data and power cables running, I know that the two don't mix very well.

The reason for this being that there is an obvious hazard if a power cable becomes exposed and manages to touch a worn down data cable at the same time there's a fire/electrical hazard. It's an unlikely event, but stranger things have happened.

There's also the fact that having power cables running in close proximity to data cables can cause attenuation to occur within the data cable.

So what I'm wondering is, how do the data pairs in a Cat 5e cable react when there's power running over other pairs in the cable? Is it simply the case that the 13W max running over an Ethernet cable is not enough to cause a noticeable degradation in performance, or is it something more tricky?

Paul Kelly (probably not *that* Paul Kelly)

PoE is, as you say, stringently power limited – the absolute maximum is 48 volts at 400mA, so the worst case scenario is only 15.4 watts going where it shouldn't.

That's not likely to ever happen, though, because the standard says that the supply shouldn't deliver *any* power if it detects a short or open circuit (defined, rather strictly, as anything outside the 15 to 33 kiloohms PoE uses to identify device classes).

It's still theoretically possible for one loose copper filament to spark somewhere and make a nuisance of itself, but it should be really, really difficult.

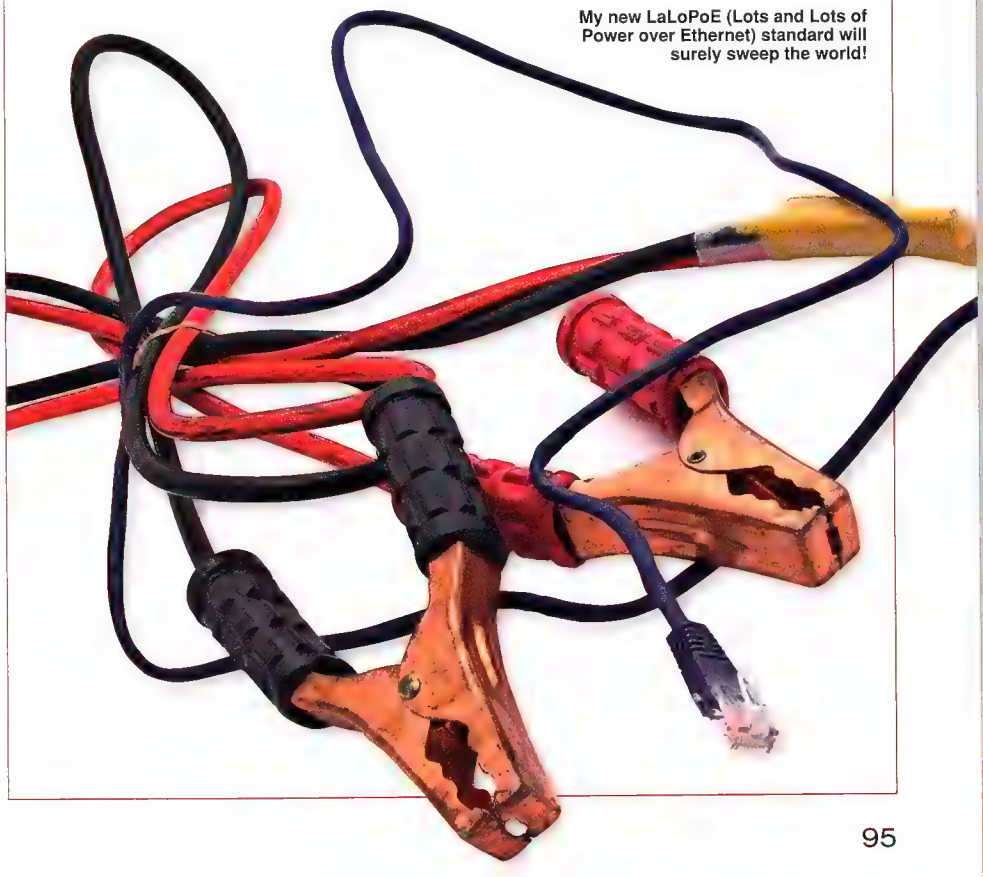
The usual problems that arise when, for instance, a roadie mistakes the Cannon plug carrying mains power for the one that's coming from the speaker cabinets, should be completely impossible.

Yes, power cables next to signal cables can indeed cause problems. Interference, not strictly attenuation, but I know what you mean.

This is also impossible with PoE, though, because it's 48 volts *DC*. No alternating current, no changing magnetic or electric field, no capacitive or inductive transfer of the AC frequency to other conductors.

This doesn't mean that dodgy PoE supplies couldn't deliver wobbly DC that causes interference anyway, but it'd have to be pretty hideous to do anything noticeable in normal computer environments. Radio telescope installations, yes. Ethernet LANs, no.

It's not at all the same thing as ye olde network cables running over the fluorescent battens, which can be counted on to drop three bits out of every five.



My new LaLoPoE (Lots and Lots of Power over Ethernet) standard will surely sweep the world!

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hotbox OF THE MONTH

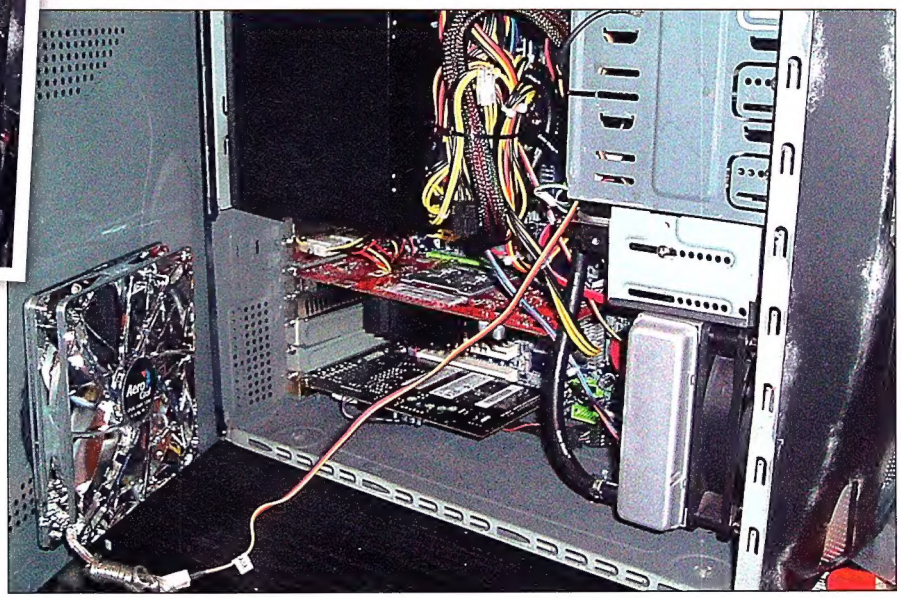
Nuke's Weapon

When I put together my new PC, I decided that creating a weapon as far as hardware was concerned would not be enough – the case had to look like a weapon as well. Also, I wanted it to be built into a mini tower chassis so that it was easily transportable to LANs.

This created a few challenges due to the cramped spacing. Firstly a decent CPU fan and heatsink would not fit under the side-mounted PSU so I went with a Cooler Master Aquagate Mini R120 water-cooling unit. The case and internal HDD cage required much work to allow room for all the goodies. These consisted of front 140mm fan and 120mm fan extracting air through the front-mounted water-cooling radiator

Fame, fortune and free stuff can be yours! Send your Hotbox to hotbox@atomicmpc.com.au and make sure you include the following details so you can be eligible:

- 6-12 high resolution, well-lit, pictures of the inside and outside of your case
- A 500-word description of how you made it, the obstacles you overcame, the tools you used, and your inspiration
- A detailed list of the machine's specs. Include CPU, video card and RAM



plus a 140mm side intake fan, also an Aerocool Gatewatch 2 thermal monitor. The front blow hole was especially tricky as it was too big for a hole saw to cut. The effect was finished off with a plastic ammo belt, feeding into the side panel and a nose cone added to the front fan. The bullets and clips that make up the ammo belt had to be individually painted to look like the real thing.

I modded a 7.62mm ammo box into a beer cooler using a peltier device, some styrofoam and a sheet of aluminium to make a cooling plate. It holds three tinnies, keeps them at a frosty 5°C and powers off the computer's PSU via a rear-mounted external molex connector. It means fewer trips to the fridge and more time for fragging.

Finally the whole thing was roughed up to look battle worn. Now my new PC really is a weapon.

technicaldetails

CPU Intel Core 2 Duo E6600
Motherboard Foxconn P9657AA
Video GeForce 7950GT 512MB PCI-E
RAM 2x 1GB DDR2 667MHz

Extras

- 160Gig SATA II HDD
- Cooler Master 550W Real Power PSU
- Aerocool Gatewatch 2

Hotbox of the month wins a
Gigabyte GA-965P-DQ6!

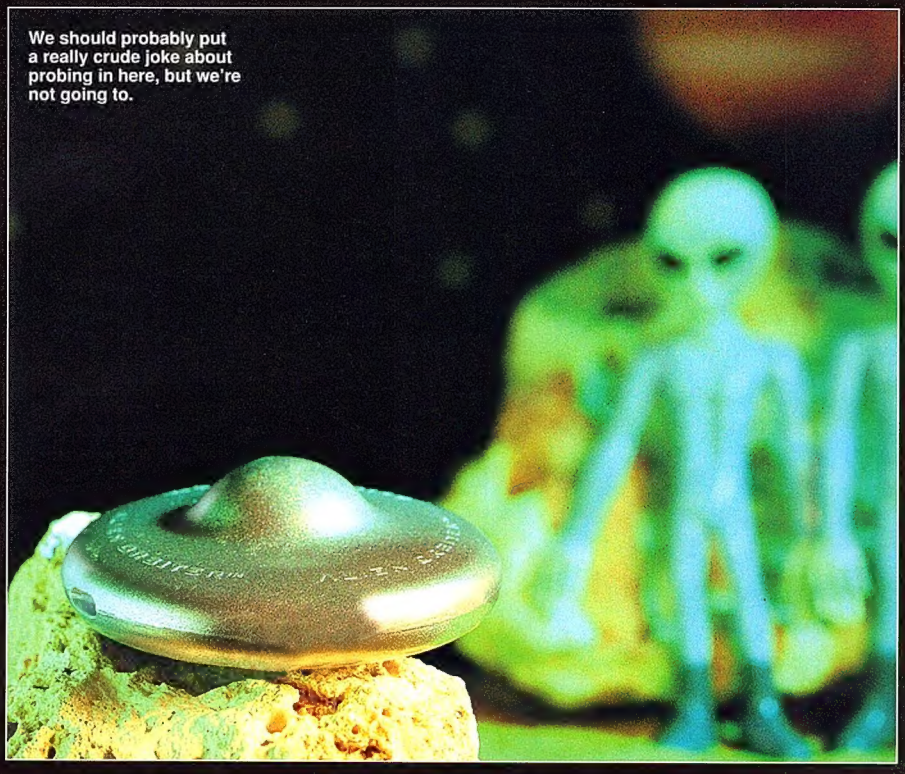
- Intel Core 2 Extreme/Core 2 Duo/Pentium D
- 8-channel Dolby and DTS
- Quiet 0dB cooling design
- Dual PCI Express for SLI
- 3Gb/s SATA with quad eSATA II
- All-solid capacitors

GIGABYTE™ TECHNOLOGY
intel P965 EXPRESS CHIPSET
Supports intel Core 2 Duo inside

FOR MORE DETAILS: www.atomicmpc.com.au/hotbox.asp

FALLOUT

Funnies and humour from the fallout zone



We should probably put a really crude joke about probing in here, but we're not going to.

I want to believe

Logan Booker can't find his tinfoil hat anywhere.

When my Creative Audigy 2 started popping and crackling like a bowl of Rice Bubbles, or perhaps a swirling black hole filled with osteoporosistic skeletons, there was only one conclusion someone as partially psychotic as myself could come to: Aliens.

An extraterrestrial species was trying to contact me through the hardware of my sound card. There was no way, at all, that it could have anything to do with awful beta drivers or dodgy multimedia speakers. No way *at all.*

My quest to track down these intergalactic travellers would no doubt prove to be a difficult one. Firstly, how could I translate those sharp cracks and disturbing hisses emanating from my Audigy? How was I going to communicate back? It's not like I had a series of halogen lights, a tone generator or Richard Dreyfuss sitting in a box somewhere. What I did have was a pen light, my collection of music CDs and a Richard Dreyfuss action figurine.

Don't ask.

I didn't really have time to do the whole Daniel Jackson/Rosetta Stone thing, so I focused my energy on transmitting my own signal across the cosmos.

Hastily I constructed a small Paddle Pop crutch to hold and aim the bulb-end of my pen light at my sound card. Next, I positioned Dreyfuss beside the pen light. He fell down a few times, even after vigorously manipulating his legs. Eventually I placed him so he was straddling the pen light. This involved reinforcing the Paddle Pop crutch with matches and although the structural integrity of my creation was assured, poor Richard's sexual orientation was not.

With pen light and Dreyfuss sorted, I attacked my music collection. Evanescence and My Chemical Romance went quickly, lest I desired my off-world friends to hate the Earth before they'd even visited it, or be struck down by a great depression and take razor to wrist in orbit. I doubted Britney Spears would leave a favourable impression and I almost dry-retched at the thought of blasting the sickly tunes of Nickelback into their awaiting ears, or whatever organ they used to interpret sound.

After a few minutes my fingers gamely yanked U2's *All That You Can't Leave Behind* from its jewel case and prayed that *Peace on Earth* would send the right message. Slotting the disc into my CD player, queuing *PonE* and slamming on repeat, I was ready to make my attempt. With careful synchronicity, I turned on both my player and my pen light.

Dreyfuss-as-Action Man trembled.

One could argue that the smell of ozone should have alerted me to the impending disaster, or even the disturbing high-pitched pops that vomited from my speakers. You could even debate, with a high degree of conviction, that the flames licking at the sides of my sound card would have been proof enough that the crap was destined to hit the fan.

And hit it did, like a beam of accelerated particles from an orbital cannon or nuclear warhead disgorged from a building with an incredibly phallic-shaped tower.

It is sufficient to say that I failed to make contact with anything, except perhaps for the 000 operator who managed to do the day's only translation… of my effeminate, panicked screaming into coherent instruction.

Other than my phone conversation, the only permanent record of my activities is the charred remains of my Dreyfuss figurine.

Who knew electrical fires could melt plastic?

NEXT MONTH

Supreme Commander modding guide

Create an interface for Supreme Commander tailored to your play style, with the help of *Atomic* and Chris Taylor – the guy who made the game!

Overclocking your CPU

With labs well-equipped for the task, we take AMD and Intel's top overclockers and push them as far as they'll go. All the information and advice you need to get top performance for nix.

Inside the PS3

Sony's next-gen console has finally arrived in Australia. We take a look at the history of the hardware, peek inside, and give you exclusive insight into the machinations of this gaming and multimedia powerhouse.

Gaming mice and keyboards

Looking for the best combination of peripherals to enhance your FPS or RTS experience? *Atomic* collects a range of devices and plays with them hard.

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'owerColor did a good job making a silent card that runs rather cold that will run fast most of the games you can buy day. It is a mainstream card that I can recommend." **Fudo, the Inquirer**

.. I honestly did not expect this kind of performance! And as long as the price is right, this card can outsell a lot of other ards and it will." **Hilbert Hagedoorn, Guru 3D**

..it really shines when placed besides its price rival from NVIDIA, the GeForce 7900 GS." **Vincent Chang, Hardware Zone**

PowerColor's ATI X1950 Pro-based card is an excellent add-in all around, with plenty to offer considering its very ompetitive price point." **Lars-Göran Nilsson, Reg Hardware**

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